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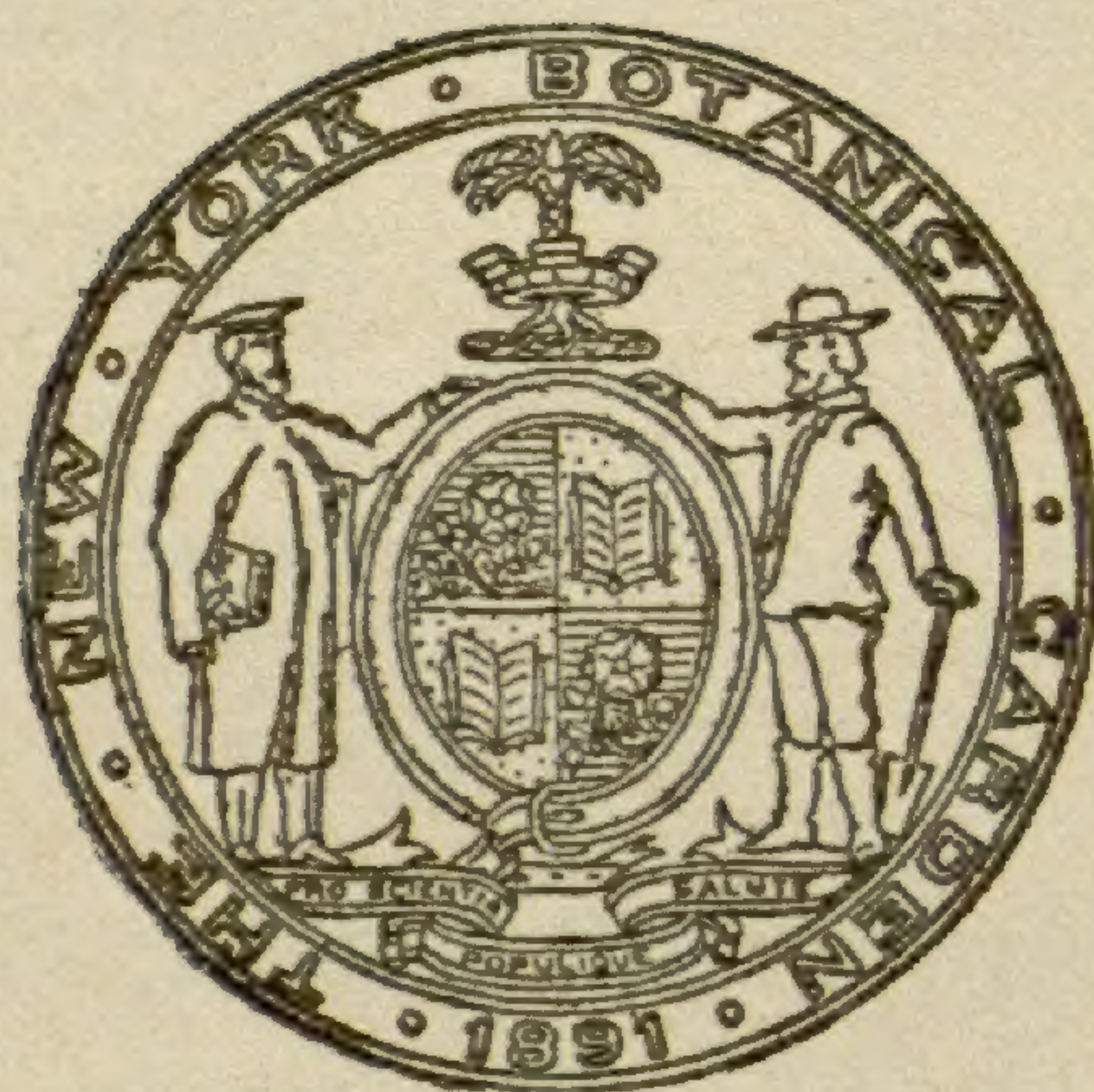
POPULAR DESCRIPTIONS

OF

PLANTS

VOLUME 22

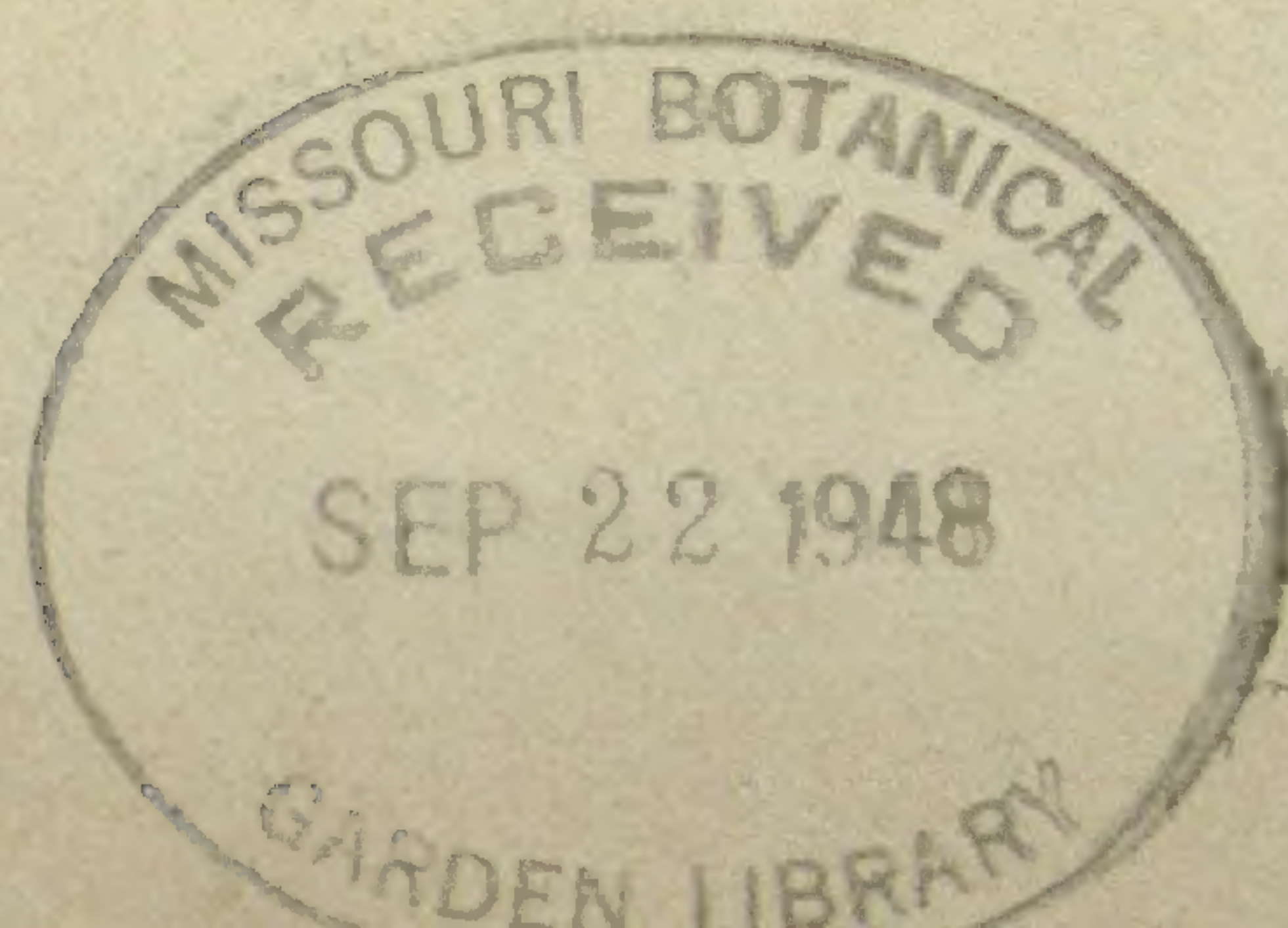
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AND
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NUMBER 1

APRIL, 1943



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THE NEW YORK BOTANICAL GARDEN

(ADDISON BROWN FUND)

DECEMBER 16, 1943

ANNOUNCEMENT

A bequest made to the New York Botanical Garden by a former President, Judge Addison Brown, established the

ADDISON BROWN FUND

"the income and accumulations from which shall be applied to the founding and publication, as soon as practicable, and to the maintenance (aided by subscriptions therefor), of a high-class magazine bearing my name, devoted exclusively to the illustration by colored plates of the plants of the United States and its territorial possessions, and of other plants flowering in said Garden or its conservatories; with suitable descriptions in popular language, and any desirable notes and synonymy, and a brief statement of the known properties and uses of the plants illustrated."

The preparation and publication of the work has been referred to Mr. Edward Johnston Alexander, Assistant Curator.

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HEXISEA BIDENTATA

HEXISEA BIDENTATA

Native of Central America

Family ORCHIDACEAE

ORCHID Family

Hexisea bidentata Lindl. Hook. Jour. Bot. 1: 8. 1834.

The brilliantly colored flowers of *Hexisea bidentata* are of outstanding merit, and certainly worthy of greater recognition. In a family overabundant with showy subjects, few can compare with this species for its brilliant orange-red flowers. Yet little mention has ever been made in horticultural publications since its introduction to cultivation in 1888. It is true that records mention it as being exhibited on several occasions at meetings of the Manchester Orchid Society in England, but little has ever been said concerning it. Could it be that it did not meet with favor among our old-time fanciers, or has it just been lost in the shuffle for larger and more commercially valuable orchids? As an unflowered plant it is quite unattractive and little can be said in its favor from this standpoint, but this can be readily overlooked when we consider its exquisite beauty when in flower.

In its natural distribution this species of *Hexisea* is largely confined to the Central American countries of Nicaragua, Costa Rica, and Panama, though it does extend into Colombia. Here it is found growing at elevations as low as 500 feet and extending up to the higher elevations of 2,500 to 3,000 feet, where it apparently is more abundant. Under these conditions it is found clinging to the native scrub trees with full exposure to the sun. Habit of growth is somewhat pendent and when in flower the plants are a blaze of color discernible for some distance.

Hexisea bidentata lends itself well to cultivation, presenting but few problems to the understanding grower. The prime requisites of good light and an airy position seem obvious when we realize the conditions under which this orchid naturally grows. The situation can best be duplicated by suspending the plants from the roof of a 60-degree growing house in a good light airy position. After growth has been completed, water must be used sparingly so that the plants may become thoroughly seasoned. With these conditions one should have little trouble in flowering hexiseas.

The potting and treatment are much the same as for maxillarias. Pots, pans or orchid baskets will serve as suitable containers as long

as there is ample provision for drainage. As a potting medium a fine grade of osmunda fiber is to be preferred, as the small delicate roots can more readily work about in a medium of this nature than a coarser one. Moderately firm potting will have direct bearing upon the health of the plants themselves as it will provide them with a firm base but still allow a proper aeration of the roots. By so doing the osmunda will remain in a sweet condition for a longer period of time, thus reducing the necessity of otherwise frequent shifting.

Hexisea bidentata is a tufted, epiphytic plant six to eight inches tall. The stems consist of a chain-like series of fusiform pseudobulbs one to three inches long, many-grooved, and covered when young with several close-fitting, fibrous-scarious, acutish sheaths. The leaves are in pairs at the apex of the pseudobulbs, two to five inches long and one-fourth inch wide, linear, bluntly two-cleft at the tip, spreading, dark green and channeled on the upper surface, paler and keeled beneath. The flowers are in few-flowered racemes from between the leaves, on pedicels one-half inch long, each pedicel subtended by an ovate, acute, papery sheath three-eighths to one-half inch long. The flowers are scarlet, about one inch across, the perianth parts spreading. The sepals are oblong-lanceolate, about one-half inch long. The lateral petals are slightly smaller, the lip about the same length and shape as the sepals, the blade sharply deflexed from the claw, which is adnate to the face of the column. The column is short, erect, with two lateral wings slightly longer than the anther, the inner margin undulate-toothed. The anther is four-celled with four subglobose pollinia on slender stalks attached to a viscid mass.

JOSEPH W. TANSEY.

EXPLANATION OF PLATE. Fig. 1.—Portion of a flowering plant. Fig. 2.—The column and labellum, side view, $\times 2$. Fig. 3.—The column and labellum, front view, $\times 2$. Fig. 4.—An anther $\times 4$. Fig. 5.—The pollinia $\times 4$.



POLYGONATUM OPPOSITIFOLIUM

POLYGONATUM OPPOSITIFOLIUM

Native of central and eastern Himalaya

Family LILIACEAE

LILY Family

Convallaria oppositifolia Wall. Asiat. Research 13: 380. pl. 4. 1820.
Polygonatum oppositifolium Royle, Ill. Bot. Himal. 1: 380. 1839.

Nepal, which is the home of *Polygonatum oppositifolium*, is a native state of India occupying a broad belt in the Central Himalayas which extends from the plains on the south to the Tibetan highlands on the north. It is probably the least known part of India as the Hindu rulers are so suspicious of foreigners that few travelers have ever been allowed to enter. Except for the British resident and his staff at Khatmandu, the capital, there are no Europeans in the country.

Most of what we know of the flora of Nepal can be attributed to three famous visitors. The pioneer collector was Buchanan-Hamilton in 1802-3. He was followed by Nathaniel Wallich in 1820-22. The third was Sir Joseph Hooker, for whom the East India Company obtained permission to visit the eastern portion in 1848. Since then—now nearly a century—virtually no new botanical knowledge of the place has reached the outside world. Yet the flora of these forested mountains is indubitably rich.

The polygonatum illustrated here was a discovery of Wallich. He promptly sent a specimen to Britain where it bloomed in the greenhouse at Kew Gardens in February and March. About 15 years later, in 1836, it was reported as still blooming regularly there, the flowers lasting many weeks. It is possible that the New York Botanical Garden's plant, which was obtained in 1902 from Berlin, was a direct descendant of the original specimen sent by Wallich from India more than 80 years earlier. Since it came from the warm, humid forest of Nepal it was never considered hardy enough to plant outdoors even in England, so it certainly could not stand our cold winters here. Except in the far South, where it might do well in a moist shady place, it is only a subject for greenhouse culture.

Of the thirty species of the genus *Polygonatum* to be found in the Northern Hemisphere, thirteen are listed in the Flora of British India and all of these are found in the Himalayas, most of them in the temperate zone, from five to ten thousand feet in altitude. In India the rhizomes of some of the species are believed to have medicinal value, as those of *Polygonatum officinale* formerly did in Europe.

Members of this genus are always graceful plants, yet they are rarely seen in gardens. *P. multiflorum* and *P. roseum* are, however, occasionally planted in Europe, and the native species are sometimes used in woodland plantings in America.

Although it is often hard to discriminate between species, the group as a whole is homogeneous and easy to recognize. There is a characteristic thick, fleshy, jointed rhizome from which a single erect shoot rises annually and grows from one and one-half to four feet tall. When this annual shoot dies down and disappears, a peculiar roundish scar is left on the rhizome. This scar is the basis for the common name "Solomon's seal," applied to the European and American species. This in turn gives rise to the once-used generic name of *Salomonina*. Another interpretation of the common name for these plants is that it was originally "Solomon's heal" because of the plant's reputed medicinal properties. The scientific name of the genus means "many-kneed," in reference to the knobby annual joints of the rhizome.

The erect shoot of the polygonatums is unbranched and the lower third or half of it is leafless. It then bears a series of handsome elliptic or linear leaves, often arranged in one plane. The leaves may be alternate, opposite, or whorled. The flowers hang from the axils of the leaves, either singly, in pairs, or in pendent umbels. In color they may be white, yellowish, green or purplish. In the species under consideration here, they are white, slightly mottled with red toward the base, and tinged with green at the perianth tips both inside and out.

Polygonatum oppositifolium is an herbaceous perennial, arising from a green creeping rhizome. The stem is from two to four feet in height, unbranched, green tinged with red. The leaves, which are opposite above and sub-opposite farther down the stem, are elliptic, acuminate, striated, and of a glossy green color, from three to five inches long and from three-quarters of an inch to an inch and a half wide, the lowest leaves being the largest ones. The petiole is short. The flowers are axillary and pendent, arranged in an umbel on a short peduncle, only one or two occurring in the upper axils, up to eight or ten in the lower. The pedicels are spotted with red and about one-half inch long. The tubular perianth, little more than half an inch in length, is white, slightly mottled with red toward the base, and tinged with green on the lobes, both inside and out, the tube being swollen below and contracted at the throat. The six stamens are inserted near the middle of the tube; the filaments are white and curved, the anthers yellow and arrow-shaped. The ovary is ovate and about half the length of the style, which, like the stamens, is included within the perianth; the stigma is truncate and obscurely three-lobed. The fruit is a round berry.

R. R. STEWART.

EXPLANATION OF PLATE. Fig. 1.—Portion of a flowering stem. Fig. 2.—A flower laid open $\times 2$.



SEDUM STENOPETALUM

SEDUM STENOPETALUM

Native of western North America

Family CRASSULACEAE

STONECROP Family

Sedum stenopetalum Pursh, Fl. Amer. Sept. 324. 1814.
Sedum lanceolatum Torr. Ann. Lyc. N. Y. 2: 205. 1827.

Temperate America is not so rich in species of *Sedum* as are the regions of the Old World with similar climate. In Europe and Asia, almost any rocky region may be expected to be the home of one or more of the stonecrops, but in North America north of Mexico there are but three species which occur outside of rather restricted areas, and only one of them, our present subject, has a really wide range.

This native American sedum grows on rocky hills and plains, on ledges and talus slopes, from North Dakota south to New Mexico and westward across the Rocky Mountains to the Pacific Coast states. It is seldom cultivated in eastern gardens for, like so many of our Western American plants, it does not enjoy our hot, humid summers, and does its best under moraine conditions. Since moraines are usually reserved for the more choice and "different" alpines, the place of *S. stenopetalum* is more easily filled by the European *S. rupestre*, which is able to stand our climate, does not require moraine conditions, and is so similar in horticultural effect that the result is practically the same. Our two most widespread eastern species, however, have a different story. They are plants of shaded, rocky woodlands, one of them, *S. ternatum*, even reveling in moist humus, a condition which no other sedum will tolerate. The other, *S. Nevii*, is a plant of shaded cliffs, hence it may be used in difficult, shady areas in rock gardens.

With the exception of *Sedum Sieboldii*, none of the sedums, however, prime rock plants though they be, can be considered as choice rock-garden subjects, for they are too invading in their habits; hence, they must be confined to sections where there are no choice plants to be choked by their rampant growth.

Our present subject was first discovered by the Lewis and Clark Expedition "on the rocky banks of Clark's River and the Kooskowsky," (now, apparently, the Clearwater) in what is now northern Idaho and adjacent Montana. It was named by the botanist Frederick Pursh from specimens brought back by that expedition.

Sedum stenopetalum is a succulent herbaceous plant with a widely spreading rootstock from which two types of aerial branches rise. The sterile branches are one to two inches tall with narrowly linear, smooth leaves one-eighth to one-half inch long. The fertile branches are one to six (rarely eight) inches tall, simple or branched, with narrowly linear leaves about one-half inch long, each stem and branch topped by a compact, cymose inflorescence of bright yellow flowers. The individual flowers are short-pediceled, about one-half inch across. The sepals are lanceolate and acute, one-eighth to three-sixteenths of an inch long, united at the base. The petals are acute, one-fourth to three-eighths inch long, narrowly lanceolate to dagger-shaped, nearly free at the base. The ten stamens are awl-shaped with yellow or purple anthers. The carpels are about one-eighth inch long, with conical body and slender styles. The fruit is an ovoid cluster of four or five carpels, each dehiscing ventrally and containing many straw-colored seeds.

E. J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Portion of a flowering plant. Fig. 2.—Calyx and corolla laid open. Fig. 3.—A carpel cluster $\times 2$.



LAVANDULA ABROTANOIDES

LAVANDULA ABROTANOIDES

Canary Lavender

Native of the Canary Islands

Family LAMIACEAE

MINT Family

Lavandula abrotanoides Lam. Encyc. 3 : 429. 1791.*Lavandula canariensis* Mill. Gard. Dict. ed. 8. Lavandula No. 4. 1768.

Here is a species of *Lavandula* which gives off a peppery rather than a lavender-like scent. There is also a dash of chrysanthemum about it (without the rankness of this plant) and a touch of ammonia, resin, and sometimes of camphor in the bruised leaves. It is not a flower-like or attractive odor.

With its much cut, gray-green, woolly leaves and terminal spikes of violet-colored bloom, the plant is handsome to have in pots. It flowers more or less all the year once started, and it grows quickly from seed. Plants have bloomed for me as early as July 10 from seed sown May 18. But they do not reach a full lush growth until the second or even the third summer. During the winter they are best kept in a cool greenhouse, and not over-watered.

Although it is not often grown, this species of lavender has apparently been known at least since the end of the seventeenth century, for Drapiez, in Vol. 6 of the *Herbier de l'Amateur de Fleurs*, published in Brussels in 1833, says that the plant was brought to Brussels in 1699 from the Canary Islands, where it is apparently endemic. In Vol. 3 of the *Encyclopédie Méthodique*, compiled by Le Chevalier de Lamarck in 1789-91, it is mentioned that the plant was being grown in the King's gardens. It was still being used as a pot-plant in Paris in 1827, according to Loiseleur-Deslongchamps, in the Parisian *Herbier Général de l'Amateur*, Vol. 8.

The earliest English reference to *Lavandula abrotanoides* seems to be in the first edition of Miller's "Gardener's Dictionary" (1731), where it occurs under the common name of "Canary lavender." The generic name, incidentally, is there spelled *Lavendula*. Later, Philip Miller mentions the plant again as *Lavendula canariensis*. It is commonly sown every spring, he reports, on borders or beds of light fresh earth, then later transplanted to other borders or into pots, where it may flower in July or August. However, he adds, it rarely ripens seed the first year, yet it seldom continues longer than two years. In the meantime, it may be preserved over winter in a greenhouse.

This has been my own experience with this unusual lavender, for I too find it very short-lived. However, it is free with its seeds and drops them into its own pot and into those standing alongside. That it can endure great heat was proved one summer when the greenhouse was emptied of all plants. Seeds that had fallen on the floor germinated and grew though the temperature sometimes rose to 120 degrees.

The specific name of *Lavandula abrotanoides*, like that of *Perofskia abrotanoides*, is derived from the resemblance of the leaves to those of *Artemisia Abrotanum*. Appropriately, *Abrotanum* comes from the Greek word *abrotos*, which means "godlike" or "very handsome." The ending *-oides* is also Greek, meaning "like" or "resembling."

The Canary lavender is a subshrub growing about thirty-two inches high and two feet across, with stems woody at the base, branches arising close to the ground, and leaves occurring thickly along the square stems, which are penciled with brown lines. When the plant is young the branches are far apart and at wide angles, but as it ages they become more bushy and very leafy. The entire plant is covered with short silky hairs. The leaves are opposite, on short petioles; the blades ovate-lanceolate in outline, from one and one-half to three inches long and from one and three-eighths to one and one-half inches across, twice-pinnate, delicate in their fine divisions, which are confluent and decurrent, gray-green in effect and soft to the touch because of their hairiness. The bare flower stalk is sometimes a foot long, having almost at its termination one or more pairs of small spikes about three-quarters of an inch long, and a few inches above them, at the tip of the stalk, a densely flowered, slender, spike-shaped inflorescence, about one and one-half inches long. Subtending the almost stemless labiate florets are furry, translucent-appearing, ovate bracts, tinged with cinnamon, marked by five raised ridges, and terminating abruptly in a pointed tip. The individual florets are about one-half inch long and slightly more than one-quarter inch across. The calyx is smooth, five-toothed, brown with a purple tinge, and hairy inside and out. The corolla tube and throat are slightly curved and are twice as long as the calyx, of deep violet-blue—"Bradley's violet" on the lower lip and "dull bluish violet" on the upper, according to Ridgway's color chart; the lower lip is three-parted and marked with purple lines, the upper lip two-parted, with lines of dots in each segment. The four stamens are fastened in the throat of the corolla, their anthers greenish-black. The stigma is two-parted, the style slender, and the ovary four-lobed. The fruit consists of four yellow-brown, minute nutlets seated in the persistent calyx.

HELEN M. FOX.

EXPLANATION OF PLATE. Fig. 1.—Top of a leafy stem with the lower part of an inflorescence peduncle. Fig. 2.—Inflorescence. Fig. 3.—A corolla laid open $\times 2$. Fig. 4.—A calyx with its subtending bract $\times 5$. Fig. 5.—Cluster of nutlets $\times 5$.



NECTANDRA CORIACEA

NECTANDRA CORIACEA

Sweetwood

Native of Florida, Yucatan and the West Indies

Family LAURACEAE

LAUREL Family

Laurus coriacea Sw. Prodr. 65. 1788; Fl. Ind. Occ. 710. 1800.
Nectandra coriacea Griseb. Fl. Brit. W. Ind. 281. 1860.

The genus *Nectandra*, a member of the aromatic Laurel family, first became known through the description made by Rottböll in 1776, based on specimens from Surinam. Because of the fragrance of the wood when cut or bruised, it is sometimes known to English-speaking peoples by the common name of "sweetwood." The name *Nectandra* is a combination of the Greek words "nektar" (nectar) and "aner, andros" (male), referring to the three nectariferous stamens present in the flower.

The sweetwood, a tree with spreading branches, grows to a height of thirty or forty feet, the trunk sometimes becoming at least a foot thick. The nearly smooth bark of the trunk and branches is light gray, whereas the entirely smooth, slender twigs are green.

The dark evergreen leaves are smooth and leathery, and the jasmine-scented flowers are borne in clusters near the tips of the branchlets. Flowering and fruiting seasons are extremely variable.

The wood* is a yellowish olive color, sometimes with streaks of dark brown. The dullness of the surface is due to the natural oil content, but beneath it there is a silky glossy undertone that gives a good luster when the wood is polished. The texture is fine and uniform and the density and consistency are medium. The lumber seasons readily without splitting, is easy to work and, because of its oil content, has a fairly high durability.

In his Prodomus Swartz describes briefly *Laurus coriacea* from Jamaica, later in the Flora Indiae Occidentalis, expanding the description to include a minute account of the floral parts. Nearly a century after, Grisebach places the species in *Nectandra*. From this time forward numerous synonyms have been added, erroneously and otherwise, until they number in the twenties. It is evident that the situation cannot be clarified without access to the types of these various synonyms, an impossibility at present. Hence, in this in-

* The data concerning the properties of the wood were kindly furnished by Dr. S. J. Record of the Yale University School of Forestry.

stance, no attempt is being made to sort out and complete this list of synonyms. It is necessary to fall back on Grisebach's concept of the species as gleaned from his description, for he saw Swartz's type from Jamaica. This description and illustration were made from specimens which coincide with Grisebach's idea of the species.

From the confusion of synonymy long involved under *Nectandra coriacea* (Sw.) Griseb. there seem at last to have emerged two separate entities: *Ocotea Catesbyana* (Michx.) Sargent and *Nectandra coriacea* (Sw.) Griseb. The former, based on *Laurus Catesbyana* Michx., and considered by various botanists to be identical with *Nectandra coriacea*, is an *Ocotea*, as revealed by the illustration which is given in Sargent's *Sylva of North America* (Vol. 7: pl. 303). The four sacs of the oblong anthers of Sargent's *Ocotea* occur in two planes, those of the lower plane slightly larger than those of the upper; whereas the four sacs of *Nectandra coriacea* form an arc-like cluster near the base of the depressed-orbicular anthers. These differences in arrangement of the anther-sacs and also the difference in formation of the cupules subtending the fruits indicate that two different genera are involved.

The sweetwood is a tree growing from thirty to forty feet tall, with spreading branches and slender, green, entirely glabrous twigs. The trunk attains a diameter of nearly one foot and it and the branches are covered with light gray, almost smooth bark. The leaves are alternate, entire, coriaceous, evergreen, shining, dark green above, dull and paler beneath, glabrous throughout, manifestly costate, with reticulations apparent at maturity or upon drying. The leaf-blades are two and one-half to six inches long, three-fourths to two and one-fourth inches broad, elliptic to elliptic-lanceolate, or lanceolate, the apex obtusely acute or subacuminate, the base often inequilateral. The petioles are three-eighths to five-eighths of an inch in length, flat, and more or less canaliculate above. The inflorescence consists of axillary or sometimes subterminal, usually densely flowered, cymose panicles, up to three and one-half inches long. The fragrant, white, perfect flowers attain a diameter of three- to five-sixteenths of an inch, and are subtended by a pedicel of equal length. The six subequal lanceolate-elliptic or oblong, obtuse lobes of the perianth, arranged in two cycles, are pubescent, spreading or often more or less reflexed at maturity, and are more than twice as long as the short tube. The stamens, numbering twelve, are four-celled, those of the first two cycles introrse, with the cells of the depressed-orbicular anthers arranged to form an arc. The stamens of the third cycle are extrorse or semi-lateral, biglandular, their anthers somewhat square or oblong with cells in two series, one above the other. Alternating with the third cycle of stamens is a fourth cycle of staminodia which are glabrous, slender yet thick-

(Concluded on page 12)



CLEMATIS HERACLEIFOLIA DAVIDIANA

CLEMATIS HERACLEIFOLIA DAVIDIANA

Father David's Clematis

Native of north and central China

Family RANUNCULACEAE

CROWFOOT Family

Clematis Davidiana Decaisne ex Verlot, Rév. Hort. 1867: 90. 1867.*Clematis heracleifolia* var. *Davidiana* Hemsl. Jour. Linn. Soc. 23: 4. 1886.*Clematis tubulosa* var. *Davidiana* Franchet, Nouv. Arch. Mus. Paris 25: 165. 1882.

Although the great majority of *Clematis* species and varieties seen in American gardens are more or less woody climbers, there are some shrubby and herbaceous plants in the genus. One attractive group of them, with lavender, blue, or violet-blue flowers, often fragrant, has long enjoyed popularity in English gardens, but has very seldom been grown here. Among these is Father David's clematis, illustrated here, a distinctive plant which deserves wider horticultural use than it has at present. In form, color, and fragrance it is strikingly reminiscent of hyacinths.

As American gardens reach beyond the stage of growing only the more common annuals and perennials, this clematis is a plant to be recommended for the perennial border. It is readily grown in any good garden soil and is easily propagated by root-division, as well as by seed. At first it was thought to be tender in the north, but it is now known to be winter-hardy up to Maine.

Clematis heracleifolia Davidiana was discovered by the missionary and distinguished naturalist, the Abbé David, who in 1863 sent to France seeds and specimens collected on the plains of Pet-Che-Li, north of Peking. Plants raised from these seeds flowered for the first time in September, 1866, and a description and notes were published the following year in the *Révue Horticole* by Verlot, who accredited the name to Decaisne. Later writers have reached the conclusion that *C. Davidiana* is the completely dioecious form of a polymorphic, polygamous, monoecious or dioecious species, the forms of which had been separately named as species. All are now merged as varieties of *C. heracleifolia* DC., the oldest name in the group. These varieties differ also in the amount of contraction of the panicle, *C. h. Davidiana* representing the extreme form in having the flowers contracted into one or two terminal or sub-terminal glomerules.

Father David's clematis is a perennial herb with several closely downy stems one to four feet tall, arising from a woody caudex and rootstock. The leaves are opposite, with stout, downy petioles two to five inches long, and grooved on the upper side. The leaf-blades are trifoliate, the two lateral leaflets ovate, two to four inches long, acute, the margins with coarse firm-tipped teeth, the upper surface rugose and rough-hairy, the lower surface reticulate; the terminal leaflet is long-stalked, obovate, sub-trilobed towards the acute apex, four to five inches long. The inflorescences are usually crowded in close heads in the leaf-axils of the two uppermost pairs of leaves, but in robust plants, sometimes smaller clusters develop in the axils of the one or two next lower pairs. The flowers are attached by a joint to the apex of short pedicels which are subtended by ovate or lanceolate, densely hairy bracts. The calyx is petaloid, about three-fourths of an inch long, white-woolly outside, glabrous within, hyacinth-blue, the divisions spreading, long-clawed, expanding into a spatulate, erose-margined blade. The petals are absent. The numerous stamens are linear and cream-colored. The stigmas are white-woolly. The fruit is a globular head of orbicular-ovate achenes about one-eighth of an inch long, each with a plumose tail an inch or more long.

E. J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Flowering portion of a stem with leaf. Fig. 2.—A stamen $\times 3$. Fig. 3.—A head of achenes. Fig. 4.—A single achene $\times 3$.

NECTANDRA CORIACEA

(Concluded from page 10)

ened at the tip, and rather more than half the length of the stamens. The ovary is glabrous, obovoid, topped by a style one-third as long, which bears a capitate stigma. The fruit is a globose or ovoid drupe, green at first, later becoming dark blue, and finally deepening to black at maturity, shining, glabrous, three-eighths to five-eighths of an inch long. It contains a single seed, nearly the size of the fruit proper, surrounded by a thin fleshy layer. The fruit is seated on the perianth-tube, the latter green, yellow, or red at maturity, enlarged to five- to seven-sixteenths of an inch in length and undulate at the apex with the remnants of the six perianth-lobes.

CAROLINE K. ALLEN,
Arnold Arboretum.

EXPLANATION OF PLATE. Fig. 1.—A flowering spray and leaves. Fig. 2.—A flower laid open, and pedicel, $\times 3$. Fig. 3.—A third cycle stamen before anthesis $\times 6$. Fig. 4.—A third cycle stamen at anthesis $\times 6$. Fig. 5.—A first or second cycle stamen $\times 6$. Fig. 6.—A staminode $\times 6$. Fig. 7.—A pistil $\times 6$. Fig. 8.—A fruiting spray. Fig. 9.—A seed.



ERYNGIUM SYNCHAETUM

ERYNGIUM SYNCHAETUM

Native of southeastern United States

Family AMMIACEAE

CARROT Family

Eryngium yuccifolium var. *synchaetum* Gray, in Coult. & Rose, Rev. N. A. Umbell. 94.
1888.*Eryngium synchaetum* Coult. & Rose, Contr. Nat. Herb. 7: 44. 1900.

A person traveling over the southeastern coastal plain of the United States, unfamiliar with the flora of the region, will frequently be impressed with some plant which to him is rather out-of-the-ordinary but obviously at home in its surroundings. Among the outstanding ones would be the eryngiums—*E. synchaetum* and its sister species *E. yuccifolium*. They give the impression of thistle-heads that do not push out the terminal “duster” so typical of thistles, but retain their rounded form, merely becoming covered with a misty green or lavender steeliness caused by the projecting stamens. Coupled with the pineapple-like foliage, these metallic-looking flower-heads but heighten the unusual effect.

Eryngium heads are familiar to many gardeners, but the members of the strictly American pandanus-leaved group of the genus are so little grown in this country as to be quite novel in appearance. Because of this very novelty, they are suitable for border plantings where a bizarre effect is desired. There are other species of the group in Mexico and South America which are more attractive than our two native species, but even of these two, only *E. yuccifolium* is reliably hardy in the north. Fortunately, it is the more showy of the two, with larger, more steely flower-heads and broader and more bluish foliage than *E. synchaetum*.

Eryngium plants are never very plentiful in the nursery trade because of their slow recovery when propagation is attempted by root-division. Quicker and better results are obtained when they are raised from seed.

A decoction made from *E. synchaetum* is used by the Seminole Indians as a ceremonial black drink, apparently in much the same way as other North American tribes have used one of the native hollies. The Indians of the Carolinas and Georgia used to make yearly pilgrimages to the coastal swamps where yaupon (*Ilex vomitoria*) grew. From its leaves they made a ceremonial black drink which they indulged in to an excess that produced an emetic

effect. This they considered cleansed the body for the year until the next pilgrimage.

Since herb dealers today use the roots of several species of *Eryngium* as the source of a diaphoretic or expectorant, it is probable that the Seminoles employ the black drink made from *E. synchaetum* for similar internal cleansing purposes.

Eryngium synchaetum is a perennial, herbaceous plant arising from a short thickened caudex with numerous hard, black, cord-like roots. The entire plant is glabrous and light green. The leaves are basal, narrowly sword-shaped, eight inches to two feet long, tapering to a long slender tip. They are somewhat fibrous, parallel-veined, the margins distantly toothed, the teeth bearing two or four bristle-like spines. The inflorescence is a paniculate cyme topping a stalk one to four feet tall and bearing sheathing leaves which become reduced towards the top of the stalk and gradually pass into the bracts at the base of the inflorescence branches. The flowers are borne in peduncled, dense, globular heads three-eighths to three-fourths of an inch in diameter, and subtended by an involucre of numerous spine-tipped lanceolate bracts one-fourth to one-half inch long. Each flower of the head is in turn subtended by a spine-tipped bract. The calyx consists of five stiff ovate sepals about one-sixteenth of an inch long. The corolla consists of five oblong greenish-white petals sharply inflexed at the middle and fastened with the five exserted stamens at the base of the disk which crowns the ovary. The gynoecium consists of two long-exserted, spreading, stigma-tipped styles and a scaly, inferior ovary of two one-celled carpels. The fruit consists of two scaly, united achenes with five oil-tubes and crowned with the persistent, hardened calyx.

E. J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—A leaf. Fig. 2.—Top of a flowering stem. Fig. 3.—A flower $\times 4$. Fig. 4.—A sepal $\times 4$. Fig. 5.—A petal $\times 8$.



LONICERA STANDISHII

LONICERA STANDISHII

Native of China

Family CAPRIFOLIACEAE

HONEYSUCKLE Family

Lonicera Standishii Carr. Fl. Serres 13 : 63. 1858.*Lonicera Standishii* Hook. Bot. Mag. pl. 5709. 1868.

Lonicera Standishii is named after the English nurseryman to whom many of Robert Fortune's Chinese introductions were consigned when he sent them home from his 19th century travels. It was distributed by the Royal Horticultural Society along with *Lonicera fragrantissima*, and for a time the two were confused. Both are somewhat similar in habit, being stout-growing shrubs with shaggy bark. They hold their leaves late in the fall and in mild climates are considered semi-evergreen. Both bloom in early spring before the new leaves appear, the time of the first opening of the blossoms depending on the appearance of a period of warm weather. This is, generally, sometime in March. If the mild weather is of short duration, no more buds will open until the cold moderates again. Ordinarily, the main blooming season will be in April, at which time the plants will be pretty well covered with small white fragrant flowers, not very conspicuous in appearance, but making their presence known by their fragrance, which is most noticeable on warm days. There is no outstanding difference in the flowers, although generally *L. Standishii* lacks the flush of pink characteristic of *L. fragrantissima*.

The most noticeable differences occur in the generally hispid character of the stems and the undersides of the more tapering leaves of *L. Standishii*. *L. fragrantissima* has smooth stems and roundish leaves. Although the two shrubs are quite similar in appearance, *L. fragrantissima* is common in the trade and in ornamental plantings, whereas *L. Standishii* is infrequently listed. The latter is not as large growing, but having other characters similar to *L. fragrantissima*, it would seem that it offered a variation from *L. fragrantissima* for garden use. It is a good shrub for boundary and mass plantings, and to be most effective it should be placed not far from the house in order that its spring fragrance may be appreciated. However, it is too roughish in winter to be considered appropriate for use in neat, dressy plantings immediately adjacent to the house. Nevertheless, the habit of holding its green leaves late

in the fall makes it useful as a background for fall flowers such as asters and chrysanthemums.

It is easily grown, requiring only well drained garden soil and sun. Vigorous pruning out of older branches is desirable in order to prevent the formation of unattractive, heavy, shaggy stems within the clump.

Lonicera Standishii is a half-evergreen shrub to seven or eight feet tall, with short, spreading, yellow-brown branches which are covered with reflexed, bristly hairs. The winter buds are flask-shaped, with two outer acuminate scales. The leaves are short-petioled, somewhat leathery, ovate-oblong to lanceolate, three to four inches long and about one to one and one-half inches wide, taper-pointed, rounded at the base, and bristly-hairy on both sides or sometimes only below. The white, sweet-scented flowers appear before the leaves. They are borne in pairs on short, curved, hispid peduncles, and are about one-half inch long. The bracts are linear-lanceolate, hairy, about twice as long as the ovaries. The calyx is shallowly five-lobed. The corolla is two-lipped, hairy, with the upper lip divided beyond the middle into four blunt lobes, longer than the gibbous tube, the lower lip consisting of one narrow, oblong lobe. The stamens are the same length as the corolla; the pistil slender with a capitate stigma. The berries are oblong, red, partly connate, and ripen in June or July.

HOWARD R. SEBOLD,
Columbia University.

EXPLANATION OF PLATE. Fig. 1.—A flowering twig. Fig. 2.—A corolla laid open. Fig. 3.—Leafy twigs and fruit.

RECENT PLATES

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AND
POPULAR DESCRIPTIONS
OF
PLANTS**

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“the income and accumulations from which shall be applied to the founding and publication, as soon as practicable, and to the maintenance (aided by subscriptions therefor), of a high-class magazine bearing my name, devoted exclusively to the illustration by colored plates of the plants of the United States and its territorial possessions, and of other plants flowering in said Garden or its conservatories; with suitable descriptions in popular language, and any desirable notes and synonymy, and a brief statement of the known properties and uses of the plants illustrated.”

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GUZMANIA MUSAICA

GUZMANIA MUSAICA

Native of Colombia

Family BROMELIACEAE

PINEAPPLE Family

Tillandsia musaica Linden & André, Ill. Hort. 20: 171. 1873.*Vriesea musaica* Cogn. & Marchal in Dalliere, Plantes Feuill. Ornam. 2, pl. 39. 1874.*Billbergia musaica* Regel, Gartenfl. 23: 378. 1874.*Caraguata musaica* André, Ill. Hort. 22: 150. 1875; and Ill. Hort. 24: 27. 1877.*Massangea musaica* E. Morren, Belg. Hort. 27: 199. 1877.*Guzmania musaica* Mez, in DC. Monog. Phan. 9: 898. 1896.

That so beautiful a foliage plant should have become widespread in cultivation within ten years of its introduction is ample testimonial to the interest which growers of the past century had in new horticultural subjects. It also speaks well of the methods of propagation which the firms of that day used to obtain a sufficient supply of plants. The greatest credit, however, is to the veteran botanical collector, Gustavus Wallis, who in 1867 discovered this plant at 3,000 feet altitude in the forests near Teorama, a short distance from Ocaña, in the province of Magdalena, Colombia (New Grenada). He sent plants in 1868 and 1871 to the horticultural establishment of J. Linden in Brussels; in 1871 to William Bull, and in 1872 to James Veitch, both these latter in London, but it was not until April, 1873, that it made its first appearance before European gardeners, when Linden placed a plant on exhibition at the exposition of the Royal Society of Agriculture and Botany at Ghent, under the name of *Tillandsia mosaica*.¹ In September, 1873, Linden offered plants for sale, and the same month Edouard André published a note in L'illustration Horticole, describing the plant as *Tillandsia musaica*, which he stated had been sent to Linden in 1871, and also that it had borne out Wallis' enthusiastic description. William Bull offered plants for sale in his catalog for 1874, in which appears in black and white the first illustration published of this plant, this same illustration appearing soon afterwards in several horticultural works. Flowers of the plant had still not been seen in Europe, but in November, 1874, Wallis, then on a visit to Europe wrote to the Gardeners' Chronicle: "I am anxious to give you some remarks about this splendid plant, because Mr. Linden has probably forgotten to name me as its discoverer, as he has done in the case of so many splendid novelties, which have adorned his stoves, and his Illustration Horticole, and his button-holes. He even by mistake attributes to others the discovery of plants which I was the first to

¹ We also know that Benedict Roezl sent plants in 1869 or 1870 to St. Petersburg, but they were dead upon arrival.

gather, and I hope nobody expects me to bear this any longer without protest.”²

In January, 1875 (p. 115), the Gardeners' Chronicle published a long letter from Albert Bruchmüller of Ocaña, Colombia. He gave the fullest details about the flowers and growth habits of the plant, and said he hoped to be able to send ripe seeds. Shortly after this letter was printed, news reached Europe that Bruchmüller had been murdered. The fruit and seed is, apparently, still undescribed.

Tillandsia musaica, then known in Europe only as to foliage, was upon its first flowering in April, 1875, deposited in *Caraguata*. This first flowering took place simultaneously for William Bull in London, and in Linden's branch establishment at Pallanza on Lake Maggiore. In 1877, Edouard Morren made for this plant a new genus, *Massangea*, which he considered as intermediate between *Caraguata* and *Guzmania*. In 1896 Carl Mez transferred both *Caraguata* and *Massangea* into *Guzmania*, where it is to be hoped our plant may rest. It is still considered one of the most ornamental of bromeliads, and is a cherished item in warm-house collections.

Guzmania musaica is a caespitose, acaulescent plant, the twelve to twenty leaves in a closely set rosette with the bases imbricated so as to form a cup in which water is retained. The leaves are somewhat papery in texture, lorate, one and a half to two feet long, two to four inches broad at the widest point, and abruptly contracted into a short, recurved tip; marked with many slender, transverse, wavy lines which are dark green on the upper face and bright brownish purple on the lower face, the whole on a glossy, pale green groundwork. The inflorescence is central and terminal, about one foot long, the peduncle covered with sheathing bracts which are striped bright red on a yellowish ground, with erect-spreading, deltoid-acuminate, red apices. The flowers are aggregated into a globose or oblong head, each flower subtended by a large orbicular-ovoid bright red bract. The calyx consists of three oblong-lanceolate, cartilaginous, valvate sepals about an inch and a half long, glabrous, and free to the base. The sepals are lemon-yellow fading to white at the rounded apex. The corolla is white, much shorter than and permanently included within the calyx. The corolla lobes are oblong, rounded apically, united into a tube for their lower two-thirds. The six stamens are white, inserted in a ring at the mouth of the corolla tube, their filaments very short, the anther-sacs linear. The pistil consists of a narrowly ovoid, three-grooved white, superior ovary, a stout white style and three partly spreading stigmas, green-papillose on the inner face. The ripe fruit has not been described.

EDWARD J. ALEXANDER.

² As a matter of fact Linden did, through André, give credit to Wallis, while Bull and Veitch, to whom the plant had also been sent, gave no credit to anyone for its introduction.

EXPLANATION OF PLATE. Fig. 1.—A leaf. Fig. 2.—Underside of leaf. Fig. 3.—An inflorescence. Fig. 4.—A sepal. Fig. 5.—Corolla, laid open. Fig. 6.—The gynoecium.



FURCRAEA MACROPHYLLA

FURCRAEA MACROPHYLLA

Native of the West Indies or Central America?

Family AMARYLLIDACEAE

AMARYLLIS Family

Furcraea macrophylla Baker, Hook. Ic. Pl. 26, pl. 2501. 1897.

An interesting example of parallel development of plant forms under similar climatic conditions is that of the aloes and their relatives in the Old World, and the agaves and their relatives in the New World. In both cases the area of natural distribution is in arid and semi-arid regions, but whereas the Old World group is in the Lily Family, the New World group is in the Amaryllis Family. The flowers of the species of *Aloe* are bright colored, and the plants continue to flower year after year, while the flowers of the species of *Agave* and its sister genus *Furcraea* are greenish or greenish-yellow, and the plants usually die after once flowering. Furthermore, aloes have very succulent leaves with gelatinous interior, but agaves and furcraeas have leaves which are hard-fibrous throughout. In fact, the fibres known as Mauritius hemp, Ceará hemp, henequen, cabuya and cahum are obtained from species of *Furcraea*, and other fibres such as sisal, ixtle, and their ilk, are obtained from species of *Agave*.

Furcraea, botanically, is closely related to *Agave*, differing in somewhat harder-textured leaves, wheel-shaped flowers, and filaments with a cushion-like swelling at the base. In general appearance, non-flowering plants of the two genera are exceedingly similar, but furcraeas tolerate a greater amount of moisture than do agaves. This is not strange, for furcraeas are less succulent. Agaves fruit freely, and when they die, usually produce suckers to continue their kind, but furcraeas rarely fruit, and when they flower, die without producing suckers. However, they take care of the future of their race by producing a large number of bulbils in the inflorescence while in flower, and these serve as effectively as seed or suckers. The inflorescence of furcraeas is a huge loose panicle, ten to forty feet tall, with drooping flowers very reminiscent of those of yuccas, but more green.

The name *Furcraea* was made to honor Ant. Francois de Fourcroy, eighteenth-century French chemist. There are several variant spellings of the name, the one here used being the original form. Our present subject is one of the rarer species of the genus, having been

discovered by Morris in 1896 on the Bahama island of New Providence, where it presumably had been introduced as a garden plant. It has since been found on other islands of the West Indies, in Central and in South America, but always in cultivation or as an escape. Its native home is still unknown. It differs from the other species of the genus in having mature leaves over forty inches long with the marginal prickles upcurved, one to four inches apart, and more than one-sixth of an inch long; it also has an inflorescence over fifteen feet tall.

Furcraea macrophylla is a semisucculent plant with a terminal rosette of large leaves on a caudex one to two feet tall. The leaves are bright green, ensiform, stiff and leathery, six to seven feet long, three to five inches broad at the middle, two inches broad and one and a half inches thick at the base, tapering into a spine-like apex, the upper face smooth and prominently ridged, the lower face scabrous; the marginal teeth are one to four inches apart and one-fourth to one-half inch long, upwardly curved into a red-brown, horny and sharp prickle. The inflorescence is a loose panicle twenty-five to thirty feet high with arching branches and pendent flowers. Freely interspersed with the flowers are many ovoid bulbils. The flowers are borne singly or in pairs in the axils of bracts along the branches of the inflorescence. They are about two inches long, on short slender pedicels. The perianth-lobes are elliptic, an inch and a quarter long, spreading, greenish-white outside and on the margins of the inner face which is otherwise greenish yellow; the entire perianth remains open after the flowering period has passed. The six stamens are slightly more than a half-inch long, with bright yellow anthers. The filaments are subulate in the upper half, below which they are abruptly swollen into an orbicular-ovoid, grooved cushion which tapers into a stipe-like base. The stigma is truncate and papillose, the style stout, expanding downwardly into the three-lobed half-superior ovary, the lower three-fourths of which is enclosed in a cylindrical hypanthium tube nearly an inch long. The fruit is an orbicular-oblong, three-grooved, thin-walled, capsule two inches long and one inch in diameter, with a short terminal beak and a short-stipitate base. The seeds are semi-orbicular, thin, black and shining.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Terminal portion of a leaf. Fig. 2.—A complete leaf, much reduced. Fig. 3.—A flowering branch. Fig. 4.—Androecium and gynoecium.



AMPELOPSIS ACONITIFOLIA GLABRA

AMPELOPSIS ACONITIFOLIA GLABRA

Chinese Woodbine

Native of eastern Asia

Family VITACEAE

GRAPE Family

Ampelopsis palmiloba Carr. Rev. Hort. 1867 : 451. 1867.*Ampelopsis tripartita* Carr. Rev. Hort. 1868 : 39. 1868.*Ampelopsis aconitifolia* var. *glabra* Diels, Bot. Jahrb. 29 : 465. 1900.*Ampelopsis aconitifolia* var. *palmiloba* Rehder, Mitt. Deutsch. Dendr. Ges. 21 : 190. 1912.*Vitis Dunniana* Lévl. in Fedde, Rep. Sp. Nov. 11 : 297. 1912.

Vines other than grapes, are, in general, grown mostly for foliage or flower effect. That some are ornamental in fruit as well as foliage is well borne out by the asiatic species of *Ampelopsis*. In *A. heterophylla*¹ (plate 530) we have one with turquoise blue berries, and in *A. aconitifolia* we have an orange-yellow-fruited one. This latter is a strong-growing, graceful climber which is not at all well-known to horticulturists, but is excellently adapted for arbor, fence, and wall covering. Two varieties are known, one with five and one with three lobes, and both are attractive, luxuriant vines. The berries, of a peculiar shade of orange-yellow, are borne rather freely, a plant in full bearing creating an unusual effect. Some of the wild specimens are said to have white, and some red berries, but this has not been the case with cultivated material.

Our plant grows in ravines and on rocky slopes and cliffs throughout eastern and east-central China. It was originally made known by means of plants grown in France from seed collected by Father David, probably in the neighborhood of Peiping (Peking). The variety here illustrated differs from the species in its usually three-parted leaves with broad lobes. The species is an even more attractive plant with leaves variously lobed and divided into comparatively narrow segments.

Ampelopsis aconitifolia is a slender, woody, deciduous-leaved climber. The stems, branches and twigs are glabrous, at first green, when older, covered with a thin light brown bark. The leaves are light green, five-foliate in the species (three-parted in the variety here illustrated), the leaflets often lobed, divided and cut, sometimes with a few hairs on the veins beneath. The petioles are one-half to two inches long, nearly terete, with a narrow groove on the

¹ The correct name of *A. heterophylla* has been shown to be *A. brevipedunculata*.

upper side. The leaflets are lanceolate or rhombic-lanceolate (rhombic in the variety), acute to acuminate at the apex, tapering at the base, the terminal one two to four inches long, the lateral ones somewhat shorter, the lowermost lateral pair always oblique on the inner side. The inflorescence is borne opposite a leaf and is a pedunculate, compound cyme, each of its branches subtended by a minute, erose-fimbriate bractlet. The flowers are yellow-green, about three-sixteenths of an inch across. The calyx is nearly orbicular, erose margined, and indistinctly lobed. The five ovate corolla lobes are valvate, blunt-tipped and incurved at the apex, not widely spreading, and early deciduous. The five stamens are borne outside the prominent, five-lobed, cup-shaped disk. The minute stigma is at the apex of a short stout style, the ovary adnate to the disk. The fruit is an orange-yellow berry one-fourth to three-eighths of an inch in diameter, containing one to four large seeds.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—A portion of an inflorescence. Fig. 2.—A flower, dissected to show parts, $\times 4$. Fig. 3.—A fruiting spray.



GUZMANIA BERTERONIANA

GUZMANIA BERTERONIANA

Native of Puerto Rico

Family BROMELIACEAE

PINEAPPLE Family

Caraguata Berteroniana Schultes, in R. & S. Syst. Veg. 7 : 1229. 1830.
Tillandsia Caraguata D. Dietr. Syn. Pl. 2 : 1059. 1840.
Caraguata grandiflora Baker, Handb. Bromel. 145. 1889.
Guzmania Berteroniana Mez, in DC. Monog. Phan. 9 : 904. 1896.

So intensely vermilion is the coloring of the inflorescence of this plant, that it must act as a beacon to guide searchers to its native abode in the mountain forests of Puerto Rico, for it certainly is a magnetic center of attraction when it flowers in the greenhouse. The contrast with its bright yellow-green foliage is a most brilliant one, but in too great a quantity would act as a pall upon the observer. The plant is, in spite of the length of time it has been known to science, exceedingly rare in cultivation, and, so far as search reveals, has never before been illustrated. The plants at The New York Botanical Garden were obtained in Puerto Rico in 1915 by the late Dr. N. L. Britton, and since then have been perpetuated by offset growths.

The genus *Guzmania*, of which some eighty-odd species are known, is tropical in its distribution, all but one species (*G. monostachia*, which extends into the subtropical region of southern Florida), being confined in the belt between the tropics of Cancer and Capricorn, and there only in the most warm and humid districts. All the species are noted for the brilliancy of their inflorescence, but the colors are only in red, green, yellow, and white, lacking the striking contrasts so notable in other members of the Pineapple Family, and well-known in the popularly grown genera *Billbergia* and *Aechmea*. *Guzmania* was so named by the botanists Ruiz and Pavon in 1802, to honor Anastasio Guzman, Spanish naturalist of the eighteenth century.

Our present subject received its specific name to commemorate Carlo Guiseppi Bertero, who first collected the species in 1818-19 in mountain woods of Puerto Rico.

Most of the epiphytic members of the Bromeliaceae, strictly American in their natural distribution, are eminently worthy of cultivation, and grown in a well-packed mixture of fern-roots and sphagnum are easily handled in a warm, moist greenhouse. Many are also easily managed even in the dry air of a city apartment, requiring only a regular supply of water in the cupped leaf-bases.

Their rarity in the general plant trade, and the small selection of species commercially available, will, it is thought, prevent their becoming popular house-plants for some time to come.

Guzmania Berteroniana is an epiphytic, acaulescent, caespitose plant, the numerous leaves forming a dense rosette, imbricated at the base so as to form a cup for the retention of water. The leaves are bright yellow-green, ligulate above a short, ovate base, about sixteen inches long and two inches wide with a short-acuminate recurved tip; glabrous and glossy on both surfaces except for a few obscure brownish scales toward the base. The inflorescence is an erect, glabrous, strobiliform and fusiform spike covered with closely-sheathing, papery bracts. The bracts are bright vermilion, the lower ones with foliaceous green tips, the upper ones with small, cuspidate tips, all, except a few of the uppermost, flower bearing. The flowers are bright yellow, two to two and one-half inches long. The three calyx-lobes are broadly elliptic and obtuse, seven-eighths of an inch long, greenish-white and striate, with an apical, reddish margin, the whole completely concealed by the floral bracts. The long, nearly cylindrical flower tube is well exserted, the corolla lobes elliptic, obtuse and spreading. The stamens are slightly shorter than the corolla and inserted at the mouth of the corolla-tube, the filaments orange, the linear anther-sacs yellow. The pistil consists of a three-angled, pale green, superior ovary, a long slender, pale green style, and three short, deep green stigmas. The fruit is a nearly prismatic capsule an inch and a quarter long, containing many slenderly curved-fusiform brown seeds each with nearly white coma.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—A complete plant, much reduced. Fig. 2.—Upper portion of a leaf. Fig. 3.—An inflorescence. Fig. 4.—A sepal. Fig. 5.—Corolla, laid open, $\times 2$. Fig. 6.—The gynoecium, $\times 2$.



DENDROCHILUM COBBIANUM

DENDROCHILUM COBBIANUM

Native of the Philippine Islands

Family ORCHIDACEAE

ORCHARD Family

Dendrochilum Cobbianum Reichb., Gard. Chron. n.s. 14: 748. 1880.*Platyelinis Cobbiana* Hemsley, Gard. Chron. n.s. 16: 656. 1881.*Acoridium Cobbianum* Rolfe, Orch. Rev. 12: 220. 1904.

In the layman's general conception of orchids, there is always pictured a large flower of some shade of purple, pink or white. As a matter of fact, these large-flowered kinds are but a small fraction of the 18,000+ known species, the great majority being small-flowered, and white, yellow, or green in color. They occur as terrestrial or epiphytic plants nearly throughout the world, but are most abundant in tropical regions.

The East Indian genus *Dendrochilum*,¹ of about 150 species, some 65 of which occur in the Philippine Islands, is one of this small-flowered majority. The numerous blossoms are borne in upright, arching, or drooping racemes, and the plants grow in such large tufts, that, even though there is only one raceme to each pseudobulb, the effect of a fringed lip is so striking that one easily understands why Blume gave his genus the name of *Dendochilum*, meaning tree-lip. These tufts grow on tree-trunks six to twelve feet above the ground, in a climate so warm and humid that leeches live in them as though they were on wet ground.

Our present subject was discovered in 1879 by William Boxall, collector for the famous British orchid dealers, Low & Co., and first flowered in the collection of Mr. Walter Cobb of Silverdale, Sydenham. It was described by the famous orchidologist, H. G. Reichenbach the younger, in 1880. The plant is now known to be of frequent occurrence on the island of Luzon at an altitude of 4500 to 7800 feet. It is now widespread in cultivation, and is especially attractive in flower; the long, hanging racemes of pleasingly colored blossoms are an adornment to any orchid collection, their pleasantly aromatic odor pervading the air for some distance away from the plant.

All dendrochilums, in fact, are desirable to orchid-growers for their wealth of intensely fragrant flowers. They must be grown in a warm, moist atmosphere in a compost of peat and sphagnum with

¹ For a full discussion of the genus *Dendrochilum* and the Philippine species, see Ames, Orch. 2: 76-122. 1908.

ample drainage, and watered freely in the growing season, the watering diminished during dormancy to merely sufficient to keep the compost moist.

Dendrochilum Cobbianum is a densely tufted, epiphytic plant. The pseudobulbs are two and one-half to three inches long, narrowly ovoid and somewhat flattened dorsally, sheathed by several fibrous scales when young, the scales at maturity shredding into persistent fibres. The solitary leaf is thin and leathery, bright green, five to nine inches long, oblong-lanceolate, with a prominent midrib, and three conspicuous nerves on each side. The blade is blunt-tipped at the apex and tapers at the base into a petiole an inch to an inch and one-half long. The scape is terminal, six to sixteen inches tall, smooth and yellow, naked below the inflorescence. The flowering portion is drooping, six to nine inches long, the rachis zigzag. The floral bracts are papery in texture, three-sixteenths of an inch long, the lower three to five empty, each of the remainder sheathing the ovary and pedicel of the flower it subtends. The flowers are about one-fourth inch apart, about a half-inch across. The sepals and petals are pale sulphur-cream color, oblong-lanceolate, acutish or blunt at the tip. The lip is wedge-shaped, bright orange-yellow, shallowly notched at the apex with two lateral calluses at the base. The column has two lateral lanceolate wings, and a terminal appendage lacerate into three to five teeth. There are four pollinia. The fruit is an oblong-ellipsoid capsule three-eighths of an inch long.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Pseudobulb, leaf and lower portion of peduncle. Fig. 2.—Inflorescence. Fig. 3.—Lip and column, $\times 3$. Fig. 4.—Face view of column, $\times 4$.



PHOTINIA VILLOSA

PHOTINIA VILLOSA

Native of eastern China and Japan

Family MALACEAE

APPLE Family

Crataegus villosa Thunberg, Fl. Jap. 204. 1784.*Photinia villosa* DeCandolle, Prodr. 2: 631. 1825.*Pourthiaea villosa* Decaisne, Nouv. Arch. Mus. Paris 10: 147, 149. 1874.

Crab-apples, hawthorns and their kin have furnished our gardens and dooryards with many decorative trees and shrubs. The ornamental kinds of apples, cherries, peaches and plums are mostly valued for their flowers, but the hawthorns, cotoneasters, pyracanthas and photinias are primarily grown for foliage and fruit. Photinias are usually thought of as suitable only for milder climates, but one species, our present subject, is a particularly desirable shrub and perfectly hardy. Its light green leaves, which turn bright red in the autumn, and its freedom from diseases and neat, clean growth make it suitable where it will fit into a planting scheme. Also in its favor are its plentifully borne flower-sprays and the long-persistent red berries which hang on all winter, but do not color until after killing frost.

So different is the deciduous *P. villosa* from the evergreen *P. serrulata*, so widely used as a dooryard shrub in the south, that an attempt was made to erect a separate genus, *Pourthiaea*, for the group centering around it. Botanical relationships, however, make it necessary to consider the two groups as a single genus.

Our plant resembles nothing so much as a slender-branched, thornless hawthorn, but it is always distinguishable by the peculiar lenticels of the inflorescence-branches, which become especially prominent in fruit. It is very variable in leaf-form, growth-form and in pubescence, and wide-ranging in one or another of its varieties from Japan well into central China. The type form is Japanese and has been longest known in cultivation.

The name *Photinia* comes from the Greek word meaning shining, in reference to the glossy leaves of the type species, *P. serrulata* Lindl.

Photinia villosa is a shrub or small tree to sixteen or eighteen (rarely thirty) feet tall, with dark gray, slightly roughened bark. The branches and twigs are rather slender, at first red-brown, becoming gray the third year. The winter buds are ovoid and small, red-brown with few, smooth scales. The leaves are two to four inches long, green and glabrous above, lighter green and hairy or

even woolly beneath (there is also a completely glabrous-leaved form). The petioles are one-fourth to three-eighths of an inch long, narrowly margined and pubescent on the upper, grooved face. The leaf-blades are obovate to oblong-obovate, acuminate at the tip and wedge-tapering at the base, the margins finely and sharply toothed. The inflorescence is terminal on short, leafy twigs, cymose, two to three inches across, ten to twenty-five flowered. The individual flowers are about a half-inch across. The peduncles and pedicels are glabrous or pubescent, with peculiar lenticels which become prominent at fruiting time. The calyx and hypanthium are glabrous or pubescent, the sepals broadly deltoid. The petals are white, orbicular with short claws. There are about twenty stamens, with pale yellow anthers. The three styles are connate except at the upper third, pale green with capitate stigmas. The ovary is depressed, woolly and three-celled. The fruit is an ellipsoid, red pome, about three-eighths of an inch long, capped with the persistent calyx. The seeds are oblong to clavate, bright brown and smooth, one to four in each fruit.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Inflorescence and leaves. Fig. 2.—A fruiting branch.



GNIDIA POLYSTACHIA

GNIDIA POLYSTACHIA

Native of southern South Africa

Family THYMELEACEAE

MEZEREUM Family

Gnidia polystachia Bergius, Pl. Cap. 123. 1767.
Gnidia carinata Thunb. Prodr. Pl. Cap. 76. 1794.
Gnidia imberbis Dry. in Ait. Hort. Kew, ed. 2, 2: 412. 1811.

Shrubs and succulents form a dominant note in the flora of South Africa. Most popular among them are crassulas, aloes, mesembryanthemums and euphorbias of the succulent group, and ericas or heaths of the shrub group. Bulbous plants and annuals are likewise plentiful but their above-ground parts are not so permanent a feature of the countryside. Similar to the heaths in appearance, but completely unrelated to them botanically, is a group of plants, about sixty species in number, composing the genus *Gnidia*. Well-known in their native land, but scarcely ever heard of elsewhere, they are an attractive group of neat-growing greenhouse shrubs, which, while their flowers have not the great variety of form and color such as the ericas possess, would well repay the horticulturist who seeks for novelties to add to our indoor decorative plants. In addition, they would, without doubt, be quite amenable to outdoor cultivation in southern California, where their sisters from Australia and New Zealand, the pimeleas or rice-flowers, have already become accepted.

The family Thymelaceae, known to eastern gardeners in the popular genus *Daphne*, is one of those peculiar groups of plants which usually have no corolla, but whose calyx imitates a corolla in both form and color. In the genus *Gnidia*, however, petals are present, four, eight, or twelve in number, though small; they make an interestingly constructed flower for the student's examination, and their heterostylous character adds to their interest. Gnidiads are restricted in nature to south and central Africa, and are most plentiful in the more southerly coastal districts, our present subject being confined almost entirely to the region within twenty or thirty miles of the coast from just north of Capetown to the region of Bathurst. There, they grow on the rocky or sandy hills, flowering in the fall (our spring), the blooms appearing in clusters at the ends of the season's growth. The flowers are fragrant, increasingly so at night.

The species here illustrated has been in cultivation in England since 1792 when it was introduced by Francis Masson, but does not appear to have come to America except as an occasional novelty in

botanical collections. It does well in an airy, warm situation in the greenhouse, where its light, graceful habit, especially when in flower, gives a pleasing effect. Of easy cultivation, it is best grown in a mixture, half each, of peat and loam with some sand added. Old plants will bear hard pruning, becoming covered with young growths soon afterwards, and cuttings root readily, quickly growing into useful flowering plants.

Gnidia polystachia is an evergreen shrub one to four (rarely six) feet tall, the older portions of stem and branches covered with a gray-brown bark. Except for the oldest parts, however, all stems and branches are covered with appressed, stiff hairs. The leaves are alternate, dark green and glabrous, crowded, spreading or ascending, one-eighth to one-fourth inch long, narrowly linear, keeled on the underside, the apex acute or acutish. The pale yellow flowers are borne in involucrate heads at the tips of the branchlets, the involucre bracts similar to the leaves but broader. The calyx is about one-half inch long, covered with long, appressed hairs, tubular below, broadening upward into a funnelform throat, the four spreading lobes ovate and obtusely pointed, glabrous on the face. The petals are white, oblong to oblanceolate, slightly more than one-sixteenth of an inch long, eight in number, arranged in four pairs at the mouth of the calyx-tube, obtuse, notched, or obliquely blunt-toothed at the apex. The eight stamens are in two series, four at the throat of the tube and four just below the petals with the anthers exerted, all with extremely short filaments. The ovary is oblong, with a tuft of hairs at the oblique apex, the slender style variable in length, but always included, the stigma capitate and hairy. The fruit is a single nutlet, enclosed in the persistent base of the calyx.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—A flowering branch. Fig. 2.—A flower, laid open, $\times 2$.



LONICERA MAACKII ERUBESCENS

LONICERA MAACKII ERUBESCENS

Native of eastern China and Japan

Family CAPRIFOLIACEAE

HONEYSUCKLE Family

Lonicera Maackii f. *erubescens* Rehder, Mitt. Deutsch. Dendr. Ges. 22: 263. 1914.*Lonicera Maackii* var. *erubescens* Rehder, in Bailey, Stand. Cycl. Hort. 4: 1910. 1916.

Bush-honeysuckles are among the most popular of shrubs for home and landscape planting, and justly so, for their profusion of fragrant bloom and abundance of bright-colored berries enhance their clean, attractive foliage. Ease of culture is another point in their favor, as well as a reasonably neat habit of growth and lack of suckers.

The majority of these plants have berries of various bright shades of red, a few are yellow, orange or black, while one species has lilac-colored, and one translucent white ones.

Although it is one of the numerous red-fruited ones, our present subject has much to recommend it, whether one grows the straight species or one of the varieties. Whereas the majority of bush-honeysuckles flower in May and fruit through the summer, *L. Maackii* flowers in June and fruits in September. The berries remain well into the winter, and the dark green foliage remains green until Christmas; thus it rivals some of the hollies in outdoor effect. If one wants a fragrant-flowering shrub, the species should be used; if a fruiting shrub only is desired, one of the varieties should be used.

The variety *erubescens* differs from the species in somewhat smaller, pinkish flowers, and in the club-like brownish stalks at the tip of which the berries are borne.

The species was discovered by Richard Maack in Manchuria in 1855-56, and first flowered in the St. Petersburg Botanic Garden in 1883. The varieties were not discovered until the present century, and neither they nor the species have ever become as widespread in cultivation as they merit, possibly because they are not carried in stock by enough dealers nor sufficiently popularized. All of the bush-honeysuckles are easily propagated by seeds or by hardwood cuttings, taken in the autumn.

Lonicera Maackii is a shrub up to sixteen feet tall, its main stems and branches clothed with thin, loose-fitting, light gray-brown bark. The year-old branchlets are orange-brown and short-hairy, the

winter buds short-ovoid, tan-colored, the scales softly pubescent except at the margins. The leaves are two to four inches long, ovate to orbicular-ovate, varying to ovate-elliptic, dark-green above, light-green beneath; the petioles one-eighth to three-eighths of an inch long; the blades acuminate at the apex, tapering or rounded at the base, pubescent only on the veins. The flowers are numerous and axillary. The pubescent peduncles are about one-eighth inch long. The minute, linear bracts and the nearly orbicular bractlets are covered and fringed with long hairs and are sprinkled with tiny glands. The twin ovaries are smooth, about one-sixteenth inch long, nearly hidden by the connate-bractlets. The calyx lobes are narrowly linear with scattered long hairs. The corolla in the species is white, fading yellowish, strongly bilabiate, glabrous, one-half to three-fourths of an inch long, the tube one-fourth inch or less long, the lobes of the limb widely spreading. The stamens and style are about three-eighths of an inch long. The fruit is a red berry, borne in pairs on the short peduncles.

The variety *podocarpa* differs in the more tardily deciduous, narrower and darker green leaves, the somewhat smaller pubescent flowers, and the stalked ovaries. The variety *erubescens* differs from the variety *podocarpa* in its pink flowers.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Portion of a twig showing leaves and flowers. Fig. 2.—A corolla, laid open, $\times 2$. Fig. 3.—A fruiting branch.

RECENT PLATES

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AND
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OF
PLANTS**

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“the income and accumulations from which shall be applied to the founding and publication, as soon as practicable, and to the maintenance (aided by subscriptions therefor), of a high-class magazine bearing my name, devoted exclusively to the illustration by colored plates of the plants of the United States and its territorial possessions, and of other plants flowering in said Garden or its conservatories; with suitable descriptions in popular language, and any desirable notes and synonymy, and a brief statement of the known properties and uses of the plants illustrated.”

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GERARDIA ACUTA

GERARDIA ACUTA

Native of northeastern United States

Family SCROPHULARIACEAE

FIGWORT Family

Agalinis acuta Pennell; Bicknell in Bull. Torrey Club 42: 338. 1915.
Gerardia acuta Pennell, Monog. Acad. Nat. Sci. Phil. 1: 470. 1935.

When the succession of the season has brought late summer to eastern North America the period of greatest and brightest bloom arrives. Heading the procession both in quantity of bloom and brilliancy of color are the members of the great Family of Composites, the asters, goldenrods, sunflowers, ironweeds, and their kin, which are one of America's chief contributions to the floral world. Lesser in quantity but not in color are the lobelias, most brilliant of which is the cardinal flower. Among the lesser lights are two bright-flowered, typically American genera; *Aureolaria*, the yellow false-foxgloves; and *Gerardia*, the pink and purple false-foxgloves. This latter one is well represented by the subject of our present plate.

There are about 60 species in the genus *Gerardia*, mostly annuals and inhabiting temperate and warm temperate zones in both North and South America, with species known between Guatemala and Peru. Growing in sandy or gravelly soil, usually in open sunny areas or in open woodlands, they are semi-parasitic, attaching their roots to various grasses and herbs, and occasionally to shrubs, and for this reason are not horticultural subjects. Their flowers open early in the morning and fall by early afternoon, so that one must visit their haunts in the forenoon to see the blossoms in full beauty. The individual flowers are very dainty and beautifully constructed, so much so that they are worth seeking out at the proper time, when they make an attractive display, in some areas studding the grassy meadows or sandy flats where they grow with many rosy-purple or pink bells whose hairy margins glisten with the morning dew.

Gerardia acuta was not known as a distinct species until 1916, when it was described in a list of the flowering plants of Nantucket. The original specimen had been collected on Martha's Vineyard in September, 1901, by M. L. Fernald. It is not a commonly found species, and growing as it does in dry sandy soil in a limited area from Massachusetts to Long Island, will probably never be plentiful. Our present plate was made from a plant collected by F. W. Pennell on the Hempstead Plains of Long Island.

Gerardia acuta is an annual herb four to sixteen inches tall. The stem and branches are striate-quadrangular, smooth or sometimes roughened on the angles, light green in color and not blackening in drying, unbranched or with several stiff ascending branches. The leaves are opposite (rarely subopposite near the summit of the stem), spreading or ascending, light green, linear, acuminate, and untoothed, three-eighths of an inch to one inch long, somewhat roughened on the upper surface. The flowers are in elongated, three- to ten-flowered racemes which terminate the main stem or its branches. The bracts subtending the flowers are leaf-like, becoming gradually smaller. The pedicels are ascending, slender, slightly thickened at the summit, smooth, in flower one-fourth to five-eighths of an inch long, longer than the bracts and lengthening in fruit. The calyx consists of a tube one-eighth of an inch long, firm-textured and prominently veined, with five triangular-acuminate minute lobes. The corolla is very delicate and membranous, three-eighths to one-half of an inch long, the tube straight, campanulate-inflated above, the five spreading lobes shallowly notched at the apex. The outside of the corolla is minutely sparse-hairy all over, more prominently so upward, the inside slightly short-hairy about the base of the filaments, more markedly so below the throat and over the base of the upper lobes; the lobes are fringed with very delicate hairs, those of the two upper ones slightly the coarser. In color the corolla is pink, the throat somewhat spotted or short streaked and with two yellow lines on the lower side within. The stamens are in two pairs, the lower pair the longer, the filaments of both hairy toward the apex; the anthers hairy on the valvular surface and smooth on the sides. The style is slender and smooth, about one-fourth of an inch long with the stigmas consisting of a line down each side of the tip. The fruit is an ovoid, yellowish brown capsule about an eighth of an inch long, seated in the persistent calyx. The minute seeds are yellowish brown, showing a prominent network of veins when viewed under a microscope.

E. J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—A flowering plant. Fig. 2.—Corolla, laid open, $\times 1\frac{1}{2}$. Fig. 3.—A stamen, $\times 5$. Fig. 4.—A ripe capsule, $\times 3$.



RUBUS LINKIANUS

RUBUS LINKIANUS

Double White Bramble

Native of Europe?

Family ROSACEAE

ROSE Family

Rubus fruticosus var. γ L. Sp. Pl. 494. 1753.*Rubus fruticosus* fl. pleno G. Savi. Fl. Ital. 1, pl. 28. 1818.*Rubus paniculatus* Schlecht. in Link, Enum. Pl. 61. 1821. Not *R. paniculatus* Smith.*Rubus Linkianus* Ser. in DC. Prodr. 2: 560. 1825.

Blackberries are so generally considered as suitable only for the fruit or berry garden, or not horticultural subjects at all, that to find one which is classed as a decorative plant is quite a surprise to many. Such, however, is the case with our present subject, whose flowers are reminiscent of double white rambler roses, but on a much more thorny bush with typical blackberry leaves. The plant may be grown in almost any soil, but by reason of its spreading habit, it is best handled as an isolated specimen plant, in semi-wild shrubbery, or in the wild garden. Under such conditions its long season of bloom makes it a desirable subject. A sister species, *Rubus ulmifolius*, has a more completely double form with pale pink flowers borne in a long inflorescence. This pink form, known as *Rubus ulmifolius bellidiflorus*, is the most desirable of all because of the color and large size of the sprays of its English-daisy-like blossoms.

The double white bramble is an old inhabitant of gardens, the first mention of it in literature being that of Petro Magnol in Le Jardin Royal de Montpellier, published in 1697, wherein he listed a double white flowered *Rubus* which had been received from the Royal Garden of Paris. Linnaeus in 1753 made it a variety of *R. fruticosus*, citing Magnol's publication so that it may be assumed he referred to the same plant. In 1818, Gaetano Savi in his Flora Italiana published the first illustration (plate 28) of this plant along with a pink-flowered form, and again cited Magnol. So far the plant appears to have been the same.

In 1821, R. F. Link in his enumeration of plants of the Royal Garden of Berlin, listed a *Rubus paniculatus* Schlechtendal with double flowers. In DeCandolle's Prodr. this same plant was renamed *R. Linkianus* because of a prior *R. paniculatus*.

Since neither Link nor DeCandolle referred to the plant of Magnol and Linnaeus, it is assumed by their placement of the name near *R. fruticosus* that they referred to the same plant and, there-

fore, the name *R. Linkianus* is taken up for it, as there does not appear to have been another double-flowered *Rubus* known at that time.

The native habitat of the plant is in doubt, although Linnaeus gives it as in hedgerows near the seacoast of Europe. Link says it is easily touched by the cold, thereby indicating a southern European origin, and English horticultural works refer to it as making its best growth in light warm soil, thereby indicating the same.

The double white bramble is a stout shrub, the robust stems grooved, short-woolly at first, becoming smooth, armed with scattered, sharply reflexed, stout, flattened prickles. The leaves are alternate, three- to five-foliolate on petioles one to three inches long, the linear hairy stipules attached nearby one-quarter of an inch above the base. The petioles, petiolules and mid-veins of the leaflets are short-woolly and bear strong, recurved prickles. The leaflets are elliptic to oval, two to four inches long, those near the inflorescences smaller, dull green and smooth above, white-woolly beneath, acute to short acuminate at the apex, rounded or subcordate at the base, the margins coarsely double serrate, occasionally with one or two shallow lobes near the base. The inflorescence is a woolly and prickly panicle up to seven or eight inches long, densely-flowered and more or less leafy-bracted. The flowers are double, white or pinkish, about one inch across. The sepals are ovate, short-acuminate, about one-fourth of an inch long, woolly inside and outside, reflexed and persistent after flowering. The petals are obovate and numerous, three-eighths to one-half of an inch long. The numerous stamens are half the length of the petals. The carpels are numerous, rarely developing into the black fruit.

E. J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—An inflorescence. Fig. 2.—A section of stem and a leaf.



FRITILLARIA PUDICA

FRITILLARIA PUDICA

Family LILIACEAE

Lily Family

Lilium pudicum Pursh, Fl. Amer. Sept. I: 228. 1814.
Fritillaria pudica Spreng. Sys. 2: 64. 1825.
Amblirion pudicum Raf. Am. Monthly Mag. 265. 1818.
Ochrocodon pudicus Rydb. Fl. Rocky Mts. 1061. 1917.

Widely diverse opinions have been expressed by horticulturists as to the decorative value of the *Fritillarias*. The Englishman, Farrer, who usually was not lacking in enthusiasm, dismisses the race with: "Not to mention—a fact which catalogs rarely do—that an enormous number of *Fritillarias* have more or less stinking bells of dingy chocolate and greenish tones, which often appear transfigured by the enthusiasm of those who desire to get rid of them, as 'rich purple,' or 'amaranthine violet.' " Few will go as far as Farrer in proclaiming their lack of charm but most experienced gardeners will agree with him that, "Many . . . are very miffy or very mimpish or both, and the family all around has a bad character."

No matter what Farrer's opinion of it may have been, *Fritillaria pudica* is really a very lovely, low-growing bulbous plant, a native of our own West, and a delightful addition to any rock garden where it can be persuaded to thrive; even in regions where it refuses to accept permanent residence it may with justice be considered as worth planting even though new bulbs must be set out every two or three years. My own experience with growing this species in the Eastern United States extends over a period of more than fifteen years, during which time I have nursed along several plantings of bulbs received from the West, but I have never achieved permanent success. After two or three, or at the most four years, the bulbs have deteriorated to such an extent that flowering ceases.

This lack of permanence is, of course, very characteristic of many Western plants that are attempted in Eastern gardens. They may be completely unaffected by low temperatures; the soil mixture in which they are planted may be compounded to the most exacting specifications; details of drainage, exposure and so forth may be given most careful consideration and yet they die out—and this despite the assurances, advice and encouragement of Westerners who obviously, and sometimes patronizingly, regard Eastern gardeners as lacking in skill in that they fail so abominably with plants that grow both plentifully and easily on the other side of the continental divide.

No doubt in the case of such plants as *Fritillaria pudica*, seasonal moisture plays a part and it may be if one protected them completely from rain and subjected them to a thorough drying out during the summer months (as is the practice with *Iris susiana* and other members of the *Oncocyclus* section of that genus), that better success would be achieved, but it is only a hope I hold out, for this treatment certainly would not help in the cases of all doubtful Westerners. Carl Purdy, who has done so much to make Western bulbs known to gardeners, recommends that this species be planted in a friable, well-drained, loamy or gritty soil and in full sun, or at most very light shade.

Fritillaria pudica occurs naturally from British Columbia to Central California and eastward to Utah, Wyoming and Montana. It is a somewhat variable species and this has caused some authors to regard the "pudica concept" as actually representing several distinct species, but most authorities do not accept this view.

Fritillaria pudica is a smooth perennial herb arising from a bulb that consists of a few fleshy scales and numerous "rice-grain" bulb-lets. Its stems are terete, from three to fourteen inches long, purple below, green and sometimes slightly glaucous above, and with leaves only below the middle. The leaves number from three to eight, the lower two on the stem appearing opposite or nearly so. They are oblong-lanceolate to lance-elliptic and obtuse, up to six inches long by one-half of an inch broad and are slightly glaucous on the upper surface. Usually the flower is solitary but occasionally from two to four flowers are produced on a single stem. They are nodding, bell-shaped, from one-half to seven-eighths of an inch long with the inner and outer perianth segments differing but slightly in size and shape. Each segment bears near its base a small, dark green gland and is blunt and papillose at the apex. In color the flowers vary from yellow to orange and occasionally are veined with brown on the outside; a uniform golden-yellow is the most common coloration. The six stamens are included and are about half the length of the perianth. Examination of specimens shows filaments of two different lengths, the long and short ones alternating but this condition possibly varies according to the stage of development. The pistil is approximately the same length as the perianth with the styles united to the apex where there is a capitate-truncate, stigmatic area; the ovary forms a bluntly three-angled prism. The fruit is an erect, more or less obovoid capsule from three-quarters to one and one-quarter inch long, tapering into a stout, stipe-like base. At maturity it is loculicidally dehiscent. The seeds are thin and flat, light brown in color, many in each of the three cells.

T. H. EVERETT.

EXPLANATION OF PLATE. Fig. 1.—A flowering plant. Fig. 2.—Two perianth segments. Fig. 3.—Androecium and gynoecium.



DROSERA FILIFORMIS

DROSERA FILIFORMIS

Native of eastern United States

Family DROSERACEAE

SUNDEW Family

Drosera filiformis Raf. Med. Rep. II. 5 : 360. 1808 ; in Desv. Jour. de Bot. 1 (1808) : 227. 1809.
Drosera tenuifolia Willd. Enum. 340. 1809.

Drosera filiformis is one of the plants that adds excitement, beauty, and enchantment to the eastern pine barrens. It transforms a sunny sandy flat into a rose-colored plain. Reflected sunshine from the glistening red glands of the leaves creates a faint reddish glow as if a sunset were transposed from sky to earth. Individual plants on a sunny day appear to be clusters of erect slender spears each with an elongated reddish halo, and in mid-June the large pink or purplish flowers provide additional spots of color.

The leaves of all the sundews are covered with purple or green hairs bearing at their tip a red gland, which exudes a viscid colorless juice. The sparkle in sunshine of these glittering drops is responsible for the common name "sundew." The glands and their viscid secretion are connected with the carnivorous habit of the sundews. This mechanism has always been of interest to naturalists and has been observed carefully in the field : "With a pair of tweezers I placed an ant upon the middle of the leaf of *Drosera rotundifolia* but so as not to disturb the plant. The ant endeavored to escape, but was held fast by the clammy juice at the points of the hairs, which was drawn out by its feet into fine threads. In some minutes the short hairs on the disc of the leaf began to bend, then the long hairs, and laid themselves on the insect. After a while the leaf began to bend, and in some hours the end of the leaf was so bent inwards as to touch the base. The ant died in fifteen minutes, which was before all the hairs had bent themselves."¹ The liquid then digests the insect tissues and the dissolved products are absorbed and used as food by the sundew. It is difficult to understand how this mechanism functions in *Drosera filiformis* except with small insects.

Drosera filiformis was introduced from New Jersey into the gardens of Edinburgh, Scotland, by Mr. James Macnab in 1834. It can be grown successfully only if considerable of the bog soil and sphagnum in which it was growing is taken with the plant. Then it

¹ J. D. Hooker, Address to the Dept. of Botany and Zoology, B.A.A.S. Belfast Meeting, 1874. Report, pp. 102-116, 1875.

must be grown in conditions which simulate its native bog. If it is planted in a pocket of live sphagnum in a situation where the drainage is poor so that the acidity of the bog soil does not drain out and the alkalinity of the surrounding soil does not drain in, it may grow and bloom for several years. If it is grown outdoors, it is helpful to put it in an undrained container to maintain a microbog.

There are about 90 species of *Drosera*, most of which live in South Africa and Australia. The leaves of all the species are inrolled and curled in bud like the fronds of ferns and in *Drosera filiformis* the partially expanded leaves resemble quite strongly the fiddle-heads of ferns. *Drosera filiformis* is endemic to the coastal plain of Massachusetts, Rhode Island, Long Island, New Jersey, and Delaware, where it grows in full sun on sandy savannah-like areas and around the edges of bogs. The generic name comes from the Greek word for Dewy, *δροσερός* and the specific name from two Latin words—*filum* meaning thread and *forma*, form.

Drosera filiformis is a perennial insectivorous herb with a short stem one-half to three-fourths of an inch long and a basal rosette of leaves. The leaves are erect, filiform, three to ten inches long and bear purple glandular hairs which copiously exude a clear viscid secretion. The stipules are adnate, fimbriate on the margins, and form a matted brown wool at the base of the leaves. The inflorescence is a cincinnus [not a raceme] nodding at the undeveloped apex. The scape is glabrous, two to nine inches high with four to sixteen flowers. The calyx and upper part of the pedicel are glandular pubescent. There are five persistent sepals which are oblong or elliptic, glandular-pilose, one-eighth to one-fourth of an inch long, one-sixteenth of an inch wide, and united at the base. The flowers are regular, about one-half inch in diameter with the parts in five's. The petals are pink (rarely white), broadly ovate, one-fourth to five-eighths of an inch long, one-quarter to one-half an inch wide, erose at the apex. There are five stamens with subulate or filiform filaments and extrorse, versatile anthers. The three styles are bipartite to the base. The ovary is superior, sessile, one-celled with three parietal placentae bearing many subglobose or ovoid ovules in two to five rows. The capsule is obovoid, one-eighth to one-fourth of an inch long and usually three-valved, with loculicidal dehiscence. The seeds are minute, anatropous, numerous, stipitate, with a loose reticulated testa. The color, shape, and size of the seeds and the reticulations of the testa are characteristic for each of our native species and a great aid in identification. The black seeds of *Drosera filiformis* are elliptic, abruptly caudate at both ends, and coarsely crateriform with the pits in sixteen to twenty lines.

FRANCES E. WYNNE.

EXPLANATION OF PLATE. Fig. 1.—Flowering plant and a separate scape. Fig. 2.—A portion of the calyx, $\times 2$. Fig. 3.—A petal, $\times 2$. Fig. 4.—A stamen, $\times 2$. Fig. 5.—A pistil showing four bipartite styles, $\times 2$.



KALANCHOË GRANDIFLORA

KALANCHOE GRANDIFLORA

Native of India

Family CRASSULACEAE

ORPINE Family

Kalanchoë grandiflora Wallich in Wight & Arn. Prodr. Fl. Ind. Or. 359. 1834.

Although a comparatively small genus, *Kalanchoë* enjoys a wide distribution over many of the warmer regions of the globe. It is represented in the indigenous floras of Africa, Asia and South America, being most abundant in the so-called Dark Continent and having its greater number of species concentrated on the island of Madagascar.

The subject of our present plate, *Kalanchoë grandiflora*, is endemic in the Nilgiri Hills of southern India where it grows, usually in rocky places, at elevations of from 3,000 to 7,000 feet. It is an abundant plant within its range and specimens that grow near springs are reported to attain large size.

First introduced to western gardens through the agency of the Royal Botanic Gardens at Kew, England, *Kalanchoë grandiflora* bloomed there for the first time in 1864; the plants that flowered were raised from seeds that had been received the previous year.

At the New York Botanical Garden this species has been in cultivation since 1901; the stock we grow today being vegetative progeny of original plants that were purchased in France by Dr. N. L. Britton when he visited the Paris Exposition in 1900. Dr. Britton acquired his material from C. Simon of Saint-Ouen who was growing his specimens wrongly labelled as *K. rotundifolia*.

Early each year *K. grandiflora* blooms freely in our main Conservatory Range (House #6) and delights visitors not only with the beauty of its clear yellow flowers but also by reason of its fragrance, which to me is pleasingly sweet but at the same time suggestive of the mouth-watering quality that one associates with lemons.

Our largest specimen is planted out in a ground bed and is some five feet high by rather more through. If its shoots, as they grew, were kept tied regularly to stakes it would be considerably taller. Without such attention the longest stems bend and are inclined to be tortuous, but grown in this natural fashion, the plant makes a highly ornamental subject for a cool display house.

Like all *Kalanchoës*, this species needs a porous, well-drained soil for its healthy development, but the medium provided should

not be lacking in fertility for these plants thrive best when given a moderately rich earth. This is particularly true when they are grown in pots or other containers. A minimum night temperature of 50 to 55 degrees suits them well and full exposure to sunshine is highly beneficial. When actively growing a generous amount of water is needed but at other times the soil should be permitted to become rather markedly dry before giving water. Feeding well-established, actively-growing potted specimens with dilute liquid manure is very helpful. Propagation may be readily effected by stem cuttings, leaf-cuttings or by seed when available. The early Fall is a good time to take cuttings to produce plants that will bloom sixteen or seventeen months thence.

It should be noted that the trivial name *grandiflora* was applied by Achille Richard to an Abyssinian species of *Kalanchoë*, but this application of the binominal is invalid because it postdates the publication of Wallich's Indian species. Richard's plant is correctly referred to *K. marmorata* of Baker.

Kalanchoë grandiflora is a succulent, glabrous, branching subshrub with many stems arising from the base. The stems are stout, green and slightly glaucous above, and grayish-brown on their older portions. At first they are erect, but as they elongate they bend under their own weight and become lax below. The leaves are opposite, fleshy, nearly sessile, ovate or obovate, and sometimes distinctly lobed; above the middle their margins are shallowly sinuate-crenate. The upper leaves are concave above, those situated lower on the stem are flat or even convex. Except for the petioles and margins of the young leaves, which are reddish-purple, the leaves are bright green, marked with a blue-gray bloom. The largest leaves measure four inches long by three inches broad; they become progressively smaller towards the apex of the stem. The inflorescence is a many-flowered corymbosely compound panicle measuring about six inches across, and furnished with conspicuous ovate or suborbicular bracts. The pedicels are one-half of an inch long. The flowers are upturned. The calyx consists of four ovate, reflexed sepals that are united briefly at the base, and are somewhat shorter than the corolla tube. The corolla is bright yellow with a bottle-shaped tube that measures about one-half of an inch long; the limb is spreading and consists of four elliptic, mucronate petals. Four long and four short stamens are fused to the throat of the corolla tube; they are scarcely exerted. The carpels, four in number, are erect, slightly adherent at their centers, each bearing at its tip a glandular stigma. The narrowly linear nectarine scales are nearly half as long as the ovaries, and notched at the apex.

T. H. EVERETT.

EXPLANATION OF PLATE. Fig. 1.—Part of an inflorescence. Fig. 2.—A leaf. Fig. 3.—Corolla, laid open. Fig. 4.—Calyx and gynoecium, showing nectarine scales. Fig. 5.—Cross-section of carpels, showing ovules, $\times 3$.



GENTIANA LINEARIS

GENTIANA LINEARIS

Native of northeastern North America

Family GENTIANACEAE

GENTIAN Family

Gentiana linearis Froel. Gent. 37. 1796.*Gentiana rubricaulis* Schwein. in Keating's Narr. Long's Exp. 2: 384. 1824.*Gentiana Saponaria* var. *linearis* Griseb. in Hook. Fl. Bor. Am. 2: 55. 1834.*Gentiana linearis* var. *lanceolata* A. Gray, Syn. Fl. 2: 123. 1878.*Dasystephana linearis* Britt., Britt. & Brown, Ill. Fl. II. 3: 13. 1913.

Blue is the least common of all flower colors and it is primarily for that reason that gentians are so much sought after by flower lovers and so often attempted as garden subjects. That they so often fail to grow in gardens (usually because of the would-be grower's failure to understand their cultural requirements, especially as to soil conditions) in no way affects their popularity.

The closed- or bottle-gentians, while they do not have the beauty of form of the open types, are the easiest ones to grow under moist woodland conditions, and since they are the dominant types in North America, they are also the easiest ones to obtain. That they are perennial as well as late-blooming is also in their favor, and they are so different from the general run of wild flowers as to attract immediate attention whenever grown or seen.

Gentiana linearis is one of the more northern species of bottle gentians in its native haunts, occurring at medium and high altitudes through the mountains of New England, the Adirondacks, northern Minnesota, and southern Canada. It is rare in the mountains of northeastern Pennsylvania, and in western Maryland and adjacent West Virginia. Wherever found it is an inhabitant of cold but sunny, moist mountain glades and meadows, frequently among rocks in springy places. The writer recalls one certain high rocky meadow in the central Adirondacks, into which he descended on a July day, and saw large blotches of blue studding the hollow below like fallen fragments of the summer sky. It is hoped that localities such as this will remain forever free from the depredations of the commercial dealer and the flower-grabber, for these sights are one of those soul-satisfying events left to the nature-conscious hiker in all too few regions of the eastern United States.

Gentiana linearis is a perennial smooth herb up to twenty-eight inches, but in average specimens fourteen to eighteen inches tall. The stems are numerous and smooth, arising from a cluster of fleshy-fibrous roots. The leaves are smooth and opposite, the lower ones

elliptic and about an inch long, the upper ones linear, two to four inches long, all bright green, somewhat narrowed at the base and acute at the apex. The flowers are sessile or nearly so, borne in cymose clusters in the axils of the uppermost two or three pair of leaves, occasionally peduncled cymes arise from the axils of some of the lower leaves. The terminal cluster of one to five flowers is always sessile and appears to be leafy-involucrate. The others are sometimes sessile and sometimes on peduncles of various lengths. Each flower is subtended at the base of the calyx by a pair of small, narrow, leaflike bracts. The calyx is tubular-funnelform, the tube about one-half of an inch long, the free sepals one inch to one-fourth of an inch long, somewhat unequal in size and length. The corolla is one and one-fourth to one and one-half inches long, narrowly ellipsoid to slender funnelform, the lobes barely spreading at the summit. In structure the corolla consists of a tubular whitish portion, most of which is included in the calyx and a broader, bright purplish blue portion divided at the top into five ovate lobes which are somewhat greenish-tinged and which alternate with five slightly shorter, whitish, triangular appendages or plaits. The inside of the corolla is paler than the outside, both plaits and lobes being nearly white. The five stamens are inserted on the corolla tube, their lower half adnate to it, their upper half free; the anthers coherent into a ring. The pistil consists of a linear-ellipsoid ovary, a stout style and two strongly recurved stigma lobes, all raised on a stout stipe one-half of an inch long. The fruit is an ellipsoid, half-flattened capsule, filled with the light brown, winged seeds.

E. J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Top of a flowering stem. Fig. 2.—Corolla, laid open. Fig. 3.—Calyx. Fig. 4.—Gynoecium.



HABRANTHUS ANDERSONII

HABRANTHUS ANDERSONII

Bronze fairy-lily

Native of Texas, Argentina, Uruguay, and Chile

Family AMARYLLIDACEAE

AMARYLLIS Family

Habranthus Andersonii Herbert, in Lindl. Bot. Reg. 16, pl. 1345. 1830.
Zephyranthes Andersonii Baker, Handb. Amaryll. 37. 1888.

The fairy-lilies and their sisters the rain-lilies are representatives of a delightful group of the Amaryllis Family which have their native homes in grassy meadows and on prairie and plain regions of the western hemisphere. Like most of the bulbous plants of similar habitat they have a short period of flowering and seeding, and then pass into more or less dormancy for the remainder of the year. The fairy-lilies (*Habranthus* and *Zephyranthes*) are mostly spring-flowering, while the rain-lilies (*Cooperia*) are autumn-flowering, and many of them when in blossom transform their habitations into a star-studded fairyland. While the flowers of the majority of the species are white or pink, there is a small group from the southwest with yellow flowers, and one species, our present subject, is bronze outside and yellow to orange inside with a dark eye. Besides being the only species with such coloring, it has the unique distinction of occurring in both Texas and southern South America. The South American plant was discovered in 1829, the Texan one in 1835, the only difference apparent between them being the somewhat broader and more round-tipped petals of the Texan material. It is obvious that both represent varieties of the same species, and since there are other plants in different Families with the same peculiar double natural range, the disjunct distribution is not sufficient evidence upon which to consider the plants as different species.

The bronze fairy-lily was discovered and introduced to European gardens in 1829, having been sent by James Anderson to a London grower, and upon its first flowering in April and May 1830 was at once published as a new species and named for its discoverer.

The genus *Habranthus* differs from the closely related genus *Zephyranthes* in having the flower turned to one side, the style and stamens declinate, with the filaments of three different lengths. In our plate the three shorter stamens have been removed so that only two of the lengths are shown.

The species of *Habranthus*, *Zephyranthes* and *Cooperia* are classed horticulturally as half-hardy bulbs, and are not usually considered reliably hardy north of Washington, D. C., except with cold-frame protection. They are easily grown in any good garden soil, and have proved hardy in New York, grown with the protection of a south-facing wall.

The bronze fairy-lily is a scapose perennial arising from a brown-tunicated, ovoid bulb one inch to one and one-fourth inch long. The leaves are narrowly linear, bright green, five to eight inches long and about one-eighth of an inch wide. The peduncle is four to six inches long, pink below, becoming bronzy green above. The spathe is about one inch long, membranous, tubular below, divided above into two lanceolate valves. The pedicel is about twice the length of the spathe. The perianth is somewhat inclined, one inch to one and one-half inch long, bronze or copper red outside, bright yellow or orange inside with a red streaked eye-zone at the base of each segment. The segments are obovate with cuspidate tips, the three outer ones somewhat the larger. The six stamens are strongly declinate, about half as long as the perianth and of three different lengths. The style is strongly declinate, about the same length as the longer stamens, with three filiform styles. The nearly cylindrical, inferior ovary is about three-fourths of an inch long. The fruit is an obovoid loculicidal capsule, depressed at the apex and strongly three-lobed. The numerous seeds are black and wafer-like.

E. J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—A bulb and leaves. Fig. 2.—A flower and seape, and a separate flower. Fig. 3.—An outer perianth segment. Fig. 4.—An inner perianth segment. Fig. 5.—Gynoecium on androecium, with three stamens removed. Fig. 6.—A mature capsule. Fig. 7.—A ripe capsule, showing dehiscence and seeds; also a single seed.



CRATAEGUS EGGLESTONI

CRATAEGUS EGGLESTONI

Eggleston's Thorn

Native of Vermont

Family MALACEAE

APPLE Family

Crataegus Egglestoni Sarg. Rhodora 3: 30. 1901.*Crataegus Brainerdi* var. *Egglestoni* B. L. Robinson; Eggleston, Rhodora 10: 82. 1908.

The well-known confusion in the genus *Crataegus* is due not only to the large number of species which have been named and described, but also to the minuteness of the differences between them. Many botanists have deprecated these distinctions as trivial and variable, and have endeavored to "lump" large numbers of the proposed species into a smaller number of more easily identified ones. While differences in such characters as size and shape of leaves of a single plant are often greater than those upon which specific differences have been founded, careful studies have shown that many of the small distinguishing characters are not at all variable, are strictly heritable, and characterize natural populations of plants. Furthermore, many of these natural groups, call them species or what one will, are extremely local in distribution. In this genus, therefore, it is obvious that the proper understanding of any natural population necessitates careful studies on living plants; until such studies are made, it is possible only to describe individual plants or very small groups growing wild or in cultivation. The botanist would be rash who would attempt, on the basis of published descriptions or of dried specimens, to unite this species with that or to identify specimens. The writers of manuals have attempted to meet the problem by the use of a relatively small number of Sections. The distinctions even among these, however, are often vague, and their names and outlines vary from author to author. *Crataegus Egglestoni*, on the basis of the excavated inner surfaces of the nutlets of the fruit, has been placed in the Section *Anomalae*; yet another student of the genus reduced it to a variety of *C. Brainerdi* in the Section *Rotundifoliae* which has nutlets with plane inner surfaces.

Crataegus Egglestoni is a much-branched shrub with slender lustrous branchlets at first orange, becoming greyish, bearing slightly recurved dark brown spines up to two and three-fourths inches long. The yellowish-green leaf-blades are oval or almost

orbicular with from five to seven short doubly serrate lobes on each side, the teeth gland-tipped; they are scabrid above with a few short white hairs, glabrous and paler below; the petioles are up to three-fourths of an inch long and commonly bear stalked glands on the upper side. The inflorescence is a reduced cyme bearing from five to fifteen flowers, its branches sparsely villose with spreading white hairs. The flowers, each about three-fourths of an inch across, are borne on often glandular stalks. The stamens number about seven; the anthers are pink (in our plate they are light yellow). The styles are two or three. The sepals are glabrous on the outer surface like the obconic hypanthium, sparsely villose on the inner surface, more or less serrate with stalked glands, reflexed after flowering and persisting on the fruit. The fruit is about one-half of an inch in diameter, red, the cavity of the calyx deep and narrow. The usually three pyrenes are about one-fourth of an inch long, prominently and often doubly ridged on the outer side, the inner faces rather shallowly excavated, sometimes plane.

H. W. RICKETT.

EXPLANATION OF PLATE. Fig. 1.—A flowering twig. Fig. 2.—A fruiting twig.

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OF
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"the income and accumulations from which shall be applied to the founding and publication, as soon as practicable, and to the maintenance (aided by subscriptions therefor), of a high-class magazine bearing my name, devoted exclusively to the illustration by colored plates of the plants of the United States and its territorial possessions, and of other plants flowering in said Garden or its conservatories; with suitable descriptions in popular language, and any desirable notes and synonymy, and a brief statement of the known properties and uses of the plants illustrated."

The preparation and publication of the work has been referred to Mr. Edward Johnston Alexander, Assistant Curator.

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THE NEW YORK BOTANICAL GARDEN



NARCISSUS BULBODOCIUM CITRINUS

NARCISSUS BULBOCODIUM CITRINUS

Sulphur-yellow Hoop-petticoat Daffodil

Native of southwestern France

Family AMARYLLIDACEAE

AMARYLLIS Family

Narcissus Bulbocodium var. *citrinus* Baker, The Florist and Pomologist 67. 1880.

It is considerably more than a quarter of a century since the Royal Horticultural Society divided the genus *Narcissus* into eleven well-defined groups. Group eleven included most of the species and especially those suited to culture in the rock-garden. Among them are *Narcissus Bulbocodium*, the Hoop-petticoat daffodil and its well-marked varieties. One of these is *N. B. citrinus* which was first collected at Biarritz, France, about 1880 by Mr. J. D. Llewellyn, a British plantsman. It is reported in The Garden (1883) that Mr. Barr, a horticultural expert of that time, described it as a bold and shapely flower of soft sulphur tint, "the colour having a luminous quality, the flower being like a little lamp of pale yellow light."

In the New York area *Narcissus Bulbocodium citrinus* flowers towards the end of April. It cannot be considered as being perfectly hardy, and will require special treatment in many gardens if its life is to be prolonged. Well-drained but rather damp soil is essential. A soil that becomes hot and dry in Summer is unsuitable. It should be planted in late Summer or indeed as soon as bulbs can be secured after the foliage has ripened. A liberal Winter covering of dry leaves held in position with branches will guard against quick freezing and thawing which interferes and even destroys root action. These roots require constant supplies of water. E. A. Bowles tells us in My Garden In Spring that he collected the bulbs from their boggy home by getting his feet wet and catching a cold, "but learned a valuable lesson as to the right position for these thirsty souls."

Narcissus Bulbocodium citrinus is a perennial herb whose leaves and flower scape arise from an ovoid, brown-tunicated bulb which is one-half to three-quarters of an inch in diameter. The two to four blue-green leaves are three to eight inches long, and about one-tenth inch wide, with shallow groove on the face. The terete scape is somewhat longer than the leaves, bearing a solitary flower. The spathe is lanceolate, united up to the ovary and slit open along one side above. The flower is one and a half to two inches long, borne on a slender pedicel about one inch long, topped by the clavate ovary. The perianth is a uniform pale lemon-yellow, the tube green.

The perianth-lobes are linear-lanceolate, acute, about three-quarters of an inch long: the corona widely obconical and about an inch long, the margin obscurely crenulate. The six stamens are unequal and declinate, nearly as long as the corona. The pistil is about the same length as the corona, with slender style and capitate stigma. The fruit is a dry capsule about one-half inch long, bluntly trigonous, the seeds black and somewhat flattened.

JAMES G. ESSON.

EXPLANATION OF PLATE. Fig. 1.—A flower and two leaves. Fig. 2.—The bulb and basal portion of the same plant. Fig. 3.—A ripe capsule. Fig. 4.—Two seeds.



CYCLAMEN NEAPOLITANUM

CYCLAMEN NEAPOLITANUM

Native of southern and southeastern Europe

Family PRIMULACEAE

PRIMROSE Family

Cyclamen neapolitanum Tenore, Fl. Napol. 3 : 197, pl. 118. 1824-29.

Ivy-leaved cyclamens, as their common name indicates, have leaves so suggestive of some types of ivy that they are sometimes mistaken for them. They are perhaps the hardiest and easiest of the cyclamens to grow in the northeast, provided the location and soil is ideal, and that they be left undisturbed when once planted. Essential requirements for their successful culture seem to be shade or at least partial shade, perfect drainage and a moist sweet soil rich in humus. The best location is under deciduous trees or shrubs or on the shady side of evergreens. They should not be planted underneath evergreens or close enough so that in a few years the trees will grow over the top of them, as they will not tolerate complete overhead shade. Since good drainage is equally important, the planting site should be on a slope, preferably facing north or west. Where the soil is acid, it should be sweetened with lime, and limestone should be mixed with the soil to keep it sweet. The tubers or corms should be set with the tops two inches deep, and I believe are best planted when dormant in the summer.

The flowers appear in late August or early September, before the leaves, and usually continue to bloom until destroyed by frost, the leaves appearing before the flowers are finished and remaining evergreen all winter. When the seed-pod starts to develop, the stalk bends downward into a spring-like coil which eventually pushes the pod down to the soil, and in some instances I have seen it actually forced into the soil.

Cyclamen neapolitanum is native in south-central and southeastern Europe, where it grows on slopes in woodland shade.

Cyclamen is a classical name, in all probability from the Greek word meaning circle in allusion to the coiled pedicels.

Cyclamen neapolitanum is an acaulescent perennial herb arising from a depressed-globose corm one to two inches in diameter, which is covered with a dark brown, corky skin, and whose roots are emitted from the upper part. The leaves, usually borne after the flowers, remain all winter. The petioles are reddish, four to six, or sometimes up to nine inches long: the blades are variable in form and size, one and one-half to three inches across, usually orbicular

to ovate-orbicular in outline, deeply cordate at the base and undulately three- to five-lobed, the lobes so placed that the leaf is sometimes ivy-like, the margin bluntly crenate, the upper surface dark green and smooth, with silvery markings, the under surface unmarked, yellow-green and smooth. The flowers are borne on reddish pedicels three to six or sometimes up to nine inches long. The calyx consists of five ovate to oblong, acute, more or less toothed lobes one-eighth inch long, with brown-purple markings. The five petals are fused near the base into a short campanulate tube, above which the oblong-obovate blades are sharply deflexed, each having a prominent auricle on either side at the junction of blade and tube. The tube is carmine within, one-fourth inch long; the blade bright pink (white in albino forms), seven-eighths inch long, with a carmine blotch at the base. The five anthers are half as long as and included in the corolla tube, one opposite each lobe, on very short filaments. The pistil is about the same length as the corolla-tube, the style and ovary flesh-colored. The fruit is a globose capsule borne on the persistent, downwardly coiled pedicel.

STUART LONGMUIR.

EXPLANATION OF PLATE. Fig. 1.—Leaves and two flowers. Fig. 2.—The calyx with gynoeceum, $\times 4$. Fig. 3.—The gynoeceum with most of the calyx removed, $\times 4$. Fig. 4.—A stamen, $\times 4$. Fig. 5.—A petal with stamen.



CYTISUS CANARIENSIS

CYTISUS CANARIENSIS

Native of the Canary Islands

Family FABACEAE

PEA Family

Genista canariensis Linn. Sp. Pl. 709. 1753.*Cytisus canariensis* Steud. Nom. ed. 1 : 259. 1821.

The flora of the Canary Islands has provided the gardener with a number of handsome plants, including the popular cineraria and Paris daisy, as well as *Phoenix canariensis*, *Aeonium tabulaeforme*, *Aichryson dichotomum*, *Limonium arborescens*, *Kleinia neriifolia*, and *Echium Wildpretii*. None is hardy at New York or in other regions where severe winters are experienced but all are susceptible to cultivation under cool greenhouse conditions, and all are useful for outdoor planting in localities where little or no frost occurs.

Among this group of decorative Canary Island natives *Cytisus canariensis* ranks high. It is popular as a winter-flowering greenhouse plant and apparently most, if not all, of the material that is currently grown by florists as *Cytisus racemosus* (also known by florists simply as "genista") belongs here. Its chief value lies in its usefulness for conservatory embellishment and for inclusion in temporary floral decorations such as are popular during the Easter season; unfortunately it so abhors the dry atmosphere of modern homes that it is practically useless as a window garden or house plant. Its cultivation presents no special difficulties. It thrives in a rich soil that is fairly fat with humus and that is well drained. Old plants should be lightly sheared back after they have finished blooming, and two or three weeks later repotting should receive attention if needed. During the summertime the plants benefit from being plunged to the rims of their pots in a bed of ashes in a sunny place outdoors. At this season specimens that have filled their pots with roots should be fed at weekly intervals with dilute liquid fertilizers, and daily spraying of the foliage with clear water encourages healthy growth and helps to keep red spider mites in check. A sunny, airy greenhouse where a night temperature of forty to fifty degrees is maintained provides a suitable home during that period when frost may occur outdoors. Propagation is very easily effected by means of cuttings taken, if possible, with a heel of the previous year's wood attached, and inserted in late spring or early fall in moist sand. Seeds, which are produced quite freely if the old flowers are not removed, also afford a ready means of increase.

On its native island of Teneriffe, *Cytisus canariensis* is described by the botanist Borgesen as inhabiting the higher areas (about 1,500 feet) of the steep rocky slopes that reach up to the laurel wood plant association. Borgesen calls attention to the fact that in places the vegetation of these slopes is comparatively luxuriant, and in the small valleys eroded by brooks is overwhelmingly rich. He says that "on the whole the vegetation here is far more luxuriant and rich in species than that of the hills and flatter low-land."

Cytisus canariensis is an-upright evergreen shrub with gracefully arching branches that are distinctly grooved, at least when young, and are furnished with a short villous pubescence. The leaves are alternate, trifoliate, on pubescent petioles that are one-eighth to three-sixteenths of an inch long. The leaflets are sessile, obovate to elliptic, up to nine-sixteenths of an inch long by a quarter of an inch broad but usually smaller, the central leaflet commonly slightly larger than the laterals, conspicuously silky pubescent on both surfaces. The inflorescences are unilateral racemes that terminate the branches and the numerous short, leafy laterals that arise from the main stems. They are from one-and-one-half to four inches long and consist of from few to as many as seventeen flowers. The flowers are bright canary yellow, fragrant, short pedicellate, five-eighths of an inch long. The silky calyx is about three-sixteenths of an inch long, the three lobes are triangular and are equal to the tube in length, the standard is orbicular, three-eighths of an inch wide and long, with a short wedge-shaped claw. The wing petals are oblong, five-sixteenths of an inch, saccate-auriculate on the lower side at the base, with a filiform claw about one-eighth of an inch long. The two keel petals are silky-pubescent, free but adnate on the lower side near the apex; they are narrowly oblong, auriculate on the upper side at the base, and with a saccate projection on the upper side slightly above the base, with a filiform claw somewhat less than one-eighth of an inch long. The stamens are connate into a tube below, the upper portion consisting of free alternately long and short filaments each tipped by a linear orange anther. The ovary is sessile, silky-hairy, and jointed on to the up-curved style. The stigma is capitate, minutely glandular. The fruit is a linear, dehiscent, hairy pod seated in the persistent calyx.

T. H. EVERETT.

EXPLANATION OF PLATE. Fig. 1.—Portion of a flowering branch. Fig. 2.—A calyx, $\times 3$. Fig. 3.—The standard. Fig. 4.—A wing-petal. Fig. 5.—A keel-petal. Fig. 6.—The androecium, $\times 3$. Fig. 7.—A ripe seed-pod.



RUELLIA AMOENA

RUELLIA AMOENA

Native of Brazil, Bolivia and Peru

Family ACANTHACEAE

ACANTHUS Family

Stephanophysum longifolium Pohl, Pl. Bras. Ic. 2: 85, pl. 156. 1831.
Ruellia amoena Nees, in DC. Prodr. 11: 203 in syn. 1847.

A few botanical families are remarkable for the many tropical plants of horticultural importance that they contain. Noteworthy among these are the *Begoniaceae*, the *Gesneriaceae*, and the *Acanthaceae*. To this latter group belongs the subject of our present plate, *Ruellia amoena*, a species attractive in bloom and useful for growing in the open air in tropical and subtropical climates, and in warm greenhouses elsewhere. Many acanthads, including *Eranthemum*, *Beloperone*, and *Sanchezia* are remarkable because of their conspicuous and often colorful bracts, but these are not featured by *Ruellia amoena*, which relies rather upon its bright green foliage and coral-scarlet flowers for its appeal to the eye.

Ruella amoena is a summer-flowering plant, and, while I have not actually tried it out of doors in the north, it seems most probable to me that it would succeed if treated in a manner similar to that accorded such tender subjects as lantanas, heliotropes, and coleuses; in short, if plants established in pots were set out after the weather is warm and settled, about early June in the vicinity of New York City. At times the gardener is apt to overlook the fact that the summer climate of New York and many other places in the United States is distinctly tropical and that many plants ordinarily thought of as greenhouse subjects only thrive as well or better if planted out of doors during our warmest months.

Ruellia amoena is native in Brazil, whence it was received by Messrs. L. Jacob-Makoy and Co., of Liege, Belgium, about 1880. In all probability this represented its first introduction into gardens, although it had been known to botanists for more than forty years previously, the plant having first been described by Pohl in 1831.

Ruellia amoena thrives in a rather light and humusy soil, a mixture such as suits begonias being well adapted to its culture. It may be cultivated in pots or pans or in hanging baskets and in larger conservatories where ground beds are installed it may be employed with excellent effect to form an edging group. Established plants appreciate fairly generous supplies of water during the season when they are growing actively, and regular feeding with dilute liquid

manure is of decided benefit at that same time, but during the winter months stimulants should be withheld and watering should be done with such care that the soil never becomes waterlogged. During bright weather frequent syringing with clear water applied in the form of a fine but forceful spray does much to promote healthy growth and discourage insect pests. *Ruellia amoena* appreciates good light and responds to full exposure to sunshine, except that when grown in comparatively low greenhouses a light shade during the summer months is of advantage. The propagation of this species presents no difficulties; seed germinates freely, and the young plants grow lustily and soon attain flowering size, cuttings root with great readiness.

Ruellia amoena is a perennial herb or sub-shrub with smooth branched stems a foot or more tall. The leaves are opposite, bright green, broadly lanceolate to ovate-elliptic, acuminate at the apex and tapered basally into a petiole one-quarter to one-third as long as the entire leaf. The leaf blades are short-hairy on both surfaces, the margins shallowly and irregularly toothed. The inflorescences are axillary few-flowered cymes borne on peduncles one and one-half to three inches long, each branch subtended by a linear bract one-quarter to three-eighths of an inch long. The flowers are on pedicels about one-quarter of an inch long; they are bright red outside and also within on the corolla lobes, the throat is straw-colored with red veining. The calyx consists of five linear-subulate lobes about three-eighths of an inch long. The corolla is about one inch long, tubular-campanulate, constricted at the base into a short slender tube, immediately above which is an inflated sac on the lower side; the corolla lobes are one-eighth of an inch long, semicircular. The four stamens are slightly shorter than and included within the corolla. The anthers are about one-eighth of an inch long, each sac bearing a short appendage at its base. The pistil is about the same length as the corolla; the ovary is green, cylindrical; the style cream-colored, very slender, becoming red towards the apex, near which is borne the unevenly two-parted stigma. The fruit is an elastically dehiscent capsule about five-eighths of an inch long. The seeds are brown and disc-like.

T. H. EVERETT.

EXPLANATION OF PLATE. Fig. 1.—Portion of a flowering branch. Fig. 2.—A corolla, laid open, showing the two pairs of stamens. Fig. 3.—A pair of stamens, $\times 2$. Fig. 4.—A single stamen, $\times 4$. Fig. 5.—The gynoecium, $\times 2$. Fig. 6.—A capsule.



ARISTOLOCHIA SEMPERVIRENS

ARISTOLOCHIA SEMPERVIRENS

Native of Crete

Family ARISTOLOCHIACEAE

BIRTHWORT Family

Aristolochia sempervirens L., Sp. Pl. 961. 1753.

Within the large genus *Aristolochia* is a great assortment of fantastic flower forms as well as great variety of size in both flower and plant. There are herbs, vines and shrubs, and flowers varying from smaller than that pictured here to nearly a foot across. Many are insignificant in flower and hence not of horticultural interest, but many others are showy and unusual, and well worth introducing into our gardens or greenhouses.

Our present subject, while not one of the large-flowered, showy ones, is nevertheless worthy of cultivation as a coolhouse climber, because of its neat habit and foliage and its freely produced flowers. It is a long-known species, with which the old herbalists and garden writers were acquainted, and is known to have been in cultivation in England as early as 1739, when it was grown in the Chelsea Garden by Philip Miller.

There are over two hundred species in the genus *Aristolochia*, nearly one-fourth of which have been used at one time or another for medicinal qualities. None now appears upon official pharmaceutical lists, although until quite recently the native American *A. Serpentaria* was in demand.

All the species of *Aristolochia* are easily raised from seed, and grow well in any good, rich soil composed of a mixture of loam and leaf-mold. Most of them are greenhouse plants, very few being hardy out of doors in the northeastern United States. One, however, *A. durior*, the dutchman's-pipe vine, is thoroughly hardy, and popular as a porch climber.

Aristolochia sempervirens is a perennial vine with angular, partly woody stems, climbing up to twenty feet. The leaves are sagittate in outline with rounded basal auricles and twisted petioles. The leaf-blades are somewhat leathery in texture, one to two and a half inches long. The flowers are solitary in the leaf-axils, on twisted pedicels about an inch long. The pedicel is bent and slightly enlarged at the summit, gradually swelling into the clavate ovary. The perianth is about an inch and a half long, sharply bent at the middle. The tube is strongly inflated at the base into a shallowly lobed portion, constricted at its top and then tubular, gradually expanding into the funnelform mouth, which is sharply oblique

with a strongly revolute margin. The coloring is characteristic, being brown-purple striped over a yellowish ground-color, the striping becoming more faint on the oblique limb. The androecium and gynoecium are united together into an angled column, bearing the anthers upon its outer sides near the apex, and with the six styles protruding from the top. The fruit is an oblong, six-celled dehiscent capsule, containing many more or less flattened seeds.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Top of a flowering stem. Fig. 2.—Perianth in cross section, showing the column. Fig. 3.—Column, $\times 5$. Fig. 4.—A leaf from the lower portion of the stem.



Mary E. Eaton

MIMULUS CARDINALIS

MIMULUS CARDINALIS

Cardinal Monkey-flower

Native of the western United States and Lower California

Family SCROPHULARIACEAE

FIGWORT Family

Mimulus cardinalis Douglas in Benth. Scroph. Ind. 28. 1835.
Erythranthe cardinalis Spach, Hist. Nat. Veg. Phaner. 9: 313. 1840.
Diplacus cardinalis Groenland in Rev. Hort. IV. 6: 137. 1857.

The foxglove or figwort family is familiar to us from a number of attractive ornamentals and some drug plants, most of which are easily grown in cultivation: veronica, foxglove, snapdragon, beard-tongue, and even the stately lavender-flowered tree, *Paulownia*.

Mimulus itself is a large genus of more than a hundred species, all annual or perennial herbs. The greater number of them are native in California and the adjacent western states. Only a few species grow naturally in the East. Aside from their numerous and abundant occurrence in the western center of distribution, a small number have followed down the great western Cordillera into the South American Andes. Still other areas of a restricted number of species are in South Africa, Asia, and Australia.

Many species are showy, with large attractive flowers, yellow, rose, pink, and bright red, or these in various combinations of colors. Their ease of cultivation and their bright color would make them much more popular but for an all too frequent viscid pubescence and unpleasant odor.

The characteristic pattern of the grinning flower-faces in all probability suggested the name *Mimulus*—the diminutive of the Latin *mimus*, a mimic or comic actor, and no doubt also suggested the common name, monkey-flower.

The species here illustrated is frequently to be found in shaded places along streams or lending bright color to weeping cliff faces in Utah and Arizona, extending westward to Oregon and California and into Lower California.

The cardinal monkey-flower is a freely branching perennial herb with erect stems that may become twenty or twenty-four inches high, rising from running rootstocks. The stems are frequently weak, tending to scramble over low shrubs or hang gracefully from moist rocks. The herbage, both stem and leaves, is soft-hairy and viscid throughout. The obovate or oblong leaves, from one to four inches long and as much as an inch and a half wide, are sessile, thin, sometimes almost hoary, strongly three-nerved, the margins finely

and outwardly toothed. Long, stout pedicels come from the axils of the upper leaves, each bearing a single bright conspicuous flower. The tubular and usually angled calyx is about an inch long, characteristically red-dotted and red-ribbed. Its five regular and uniform teeth are about a quarter of an inch long, ciliolate, broadly ovate at the base but acutely pointed. The strongly two-lipped corolla, becoming two inches long, varies in color from brilliant scarlet and rose to pale pink and yellow. The cylindrical tube, mostly enclosed by the calyx and the throat, is usually orange striped with red. The upper lip, partly enclosing the four stamens and anthers joined in two pairs, is erect, with its two lobes turned backwards. The flaring lower lip has a broad-spreading middle lobe and strongly reflexed lateral ones. The stigma is bilobed and ciliate, and is elevated beyond the stamens on a slender glabrous style. The capsule is oblong, sharply pointed and glabrous, producing numerous small, oblong, net-veined seeds.

BASSETT MAGUIRE.

EXPLANATION OF PLATE. Fig. 1.—Tip of a flowering stem. Fig. 2.—The underside of a corolla and the calyx. Fig. 3.—A capsule.



SANVITALIA PROCUMBENS

SANVITALIA PROCUMBENS

Native of Mexico

Family CARDUACEAE

THISTLE Family

Sanvitalia procumbens Lam., Journ. Hist. Nat. Par. 2: 178, pl. 33. 1792.*Sanvitalia villosa* Cav., Ic. 4: 31, pl. 351. 1797.*Lorentea atropurpurea* Ortega, Nov. Rar. Pl. Hort. Matr. 41, pl. 5. 1797.

Among the most characteristic of American plants are the representatives of the great family of composites, whose members are scattered all over the world, but whose variety and quantity is so great in the two Americas as to make them a dominant note in any floral landscape. One has but to imagine our gardens without cosmos, zinnias, marigolds, coreopsis, gaillardias, dahlias, ageratum, and sunflowers, practically all North American in origin, to realize some of the great gifts of this continent to horticulture. That they are all composites speaks also of the horticultural importance of that family of plants. It is interesting as well to note that the majority of them are from Mexico, a country which still has a great wealth of plant material not known to our gardens, and worthy of introduction.

Our present subject is also a native of Mexico, and in it we have the only low-growing, yellow-flowered annual suitable for border edgings. Although described in 1792, living plants were not seen in Europe until September, 1796, when plants raised from Mexican seed flowered in the Royal Garden in Madrid. It was first introduced into England by the Lady Bute, who obtained seed from Madrid in 1798, but nearly thirty years passed before it came to popular attention. It is still not often enough grown in American gardens for the purpose to which it is so eminently suited. In its three forms, single, semi-double, and double-flowered, it is neat-growing and in late summer and fall well studded with bloom. It is easily grown from seed, and with early sowing requires no further care other than watering, and not too much of that, for it is accustomed to a dry climate. It is also suitable as a basket plant, and may be grown indoors by fall sowing when a low effect is desired in the greenhouse. In its native state it is a common plant along roadsides, in ditches, and on hillsides, growing best where there is slight moisture, but freer with its flowers where dry. It is native over nearly all of Mexico, being absent from the extreme northwest and the tropical areas, and most plentiful in the central and southern desert areas.

The name *Sanvitalia* is in honor of a noble Italian family of the eighteenth century.

Sanvitalia procumbens is a trailing annual herb with hairy stems three or four inches tall. The leaves are opposite, usually entire, ovate to lance-ovate, about an inch long and coarse-hairy. The heads are solitary at the ends of the branches, about three-fourths inch across. The involucre is about one-fourth inch in diameter, semi-orbicular, the scales abruptly sharp-tipped, with coarse, scattered hairs near the apex, the margins coarsely ciliate. The receptacle is conic. The rays are bright yellow, often in more than one series, a sixteenth to an eighth inch long, pistillate and fertile, their achenes three-angled, each angle produced into a rigid, spreading spine. The disk-florets are tubular, with dark yellow tube, the upper portion of which, as well as the five triangular lobes, are dark brown-purple. Each floret is partly enfolded by a papery bract (chaff), white below, the apex red-brown, and with some coarse hairs; the midrib is produced into a hard, red-brown apiculus. The achenes are variable, all dorsally flattened: the outer series with two pappus bristles, sparsely papillose face, and broad marginal wings which are deeply lobed and ciliate; the inner series passing through a reduction of wings and pappus and an increase of papillae on the surface.

EDWARD J. ALEXANDER.

EXPLANATION OF PLATE. Fig. 1.—Portion of a flowering plant. Fig. 2.—Chaff, $\times 4$. Fig. 3.—An achene of a disk-floret, $\times 4$.



PRIMULA FORBESII

PRIMULA FORBESII

Baby Primrose

Native of Yunnan, China: The Shan States, eastern Burma

Primula Forbesii Franchet, Bull. Soc. Bot. France 33 : 64. 1886.

Since *Primula malacoides* became so universally grown as a winter and spring greenhouse flowering plant, the allied *P. Forbesii*, which is so much smaller and less striking, has lost its popularity. However, about fifteen or twenty years ago it had admirers and was grown by a number of gardeners.

P. Forbesii, or the baby primrose as it has been named, although perhaps strictly an annual, may be considered a biennial since it may form seedling plants the first year and die after flowering the following year.

A soil that is open but still rich in humus is suited to its needs. Seeds may be sown in a well-drained pan filled with such soil in late Spring or early Summer. When seedlings are large enough to handle they may be potted singly in community pots. The crowns of the plants must be even with the soil surface. The young plants should be stationed in a cool, airy position such as may be found in a coldframe, but near the light so that sturdy growth may be assured. At the same time they should be shaded from direct sunshine. As the pots are filled with roots, a shift to larger pots will be necessary and a four-inch size will be large enough for the flowering stage. In the Fall they may be transferred to the greenhouse. At no time must they be allowed to become dry, but overwatering during Winter may be harmful. At that time a temperature of from 45–50° F. is suitable.

In subtropical and other very mild climates this primrose may be grown successfully in the rock garden.

Primula Forbesii was first found growing in marshy ground near Tali in Yunnan, China, by the French missionary Delavay and later by Sir H. Collett F.L.S. "in great abundance on the hills of the Shan States in eastern Burma at an elevation of three thousand feet." It was exhibited for the first time in London in December 1891 by M. M. Vilmorin, Andrieux & Cie.

The baby primrose is an annual or biennial, acaulescent and rosulate herb, its leaves and flower scape arising from the crown of a cluster of fibrous roots. The leaves are coarsely hairy; the petioles an inch to an inch and a half long; the blades an inch to an inch

and a half broad, and an inch and a quarter to two inches long, ovate in outline, slightly cordate at the base and obtuse at the apex, the margins irregularly lobed and undulate, the lobes irregularly toothed. The scape is six inches to two feet tall, slender, minutely hairy on the lower part, farinaceous on the upper part and in the inflorescence. The flowers are borne in two or three widely separated whorls, each whorl five- or six-flowered, the slender pedicels one-half to three-quarters of an inch long, and elongating after the flower has fallen. The calyx is funnel-shaped, about one-fourth inch long, the lobes ovate and pointed. The corolla is salverform, the tube narrower and a little longer than the calyx, whitish-yellow outside and bright yellow inside, forming a yellow eyespot surrounded by a white circle at the center of the flower: the limb about one-half inch across, divided into five obovate, deeply notched lobes, lavender-pink to pale lilac in color, the throat partly closed by five inflexed, blunt teeth, each opposite a corolla-lobe. The five stamens are inserted at the middle of the corolla-tube on very short filaments, so that they are completely concealed. The pistil consists of a globular ovary, and a slender style terminated by a capitate stigma. The fruit is a globose capsule included within the persistent calyx.

JAMES G. ESSON.

EXPLANATION OF PLATE. Fig. 1.—An inflorescence. Fig. 2.—The rosette of leaves with the base of the inflorescence. Fig. 3.—A corolla laid open, showing stamens, $\times 2$.

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